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ABSTRACT

These three issues of volume 2 (1992) contain brief reports on published research of the National Center for Research in Vocational Education. In issue 1 are these five articles: "High Schools with Character: Why Might They Be Important?"; "An Uncommon Education: Interaction and Innovation"; "Community College Contract Instruction: Complex Issues"; "SET [Security, Employee involvement, and Training] and JAM [Job classification, Adversarial relations, and Minimal training] Work Systems: Implications for Education"; and "A National Database on Vocational Teacher Education." Issue 2 contains five articles: "Health Care Personnel Shortages and Vocational Education"; "Using Postsecondary Transcript Data"; "Nice Places to Work: Schools with Exemplary Vocational Education Programs"; "New York City's Career Magnet Schools Benefit 'Lottery' Students"; and "Beyond Articulation: Tech Prep Programs." Nine articles are found in issue 3: "A How-To Guide for Perkins Act Accountability"; "Computer-Based Instruction and Issues for Vocational Educators"; "Community Colleges and Technical Institutes: Integration of Occupational and Academic Education"; "Career Magnet High Schools: Students, Staff Talk about Successes and Problems"; "Vocational Education for Pregnant and Parenting Students: Practical Problems and Fundamental Dilemmas"; "Vocational Education at Penal Institutions: A Discouraging History"; "Linking Planning and Evaluation Statewide"; "Two Worlds: Vocational and Academic Teachers"; and "A Framework for the Subject Matter of Vocational Education." (YLB)

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Volume 2
Numbers 1-3

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NCRVE Change Agent

Volume 2, Number 1, Spring 1992 National Center for Research in Vocational Education

ABOUT NCRVE

The Center is established under authorization of the Carl D. Perkins Vocational Education Act to conduct applied research and development in vocational education. Our mission is to engage in research and service activities designed to make a new vision of work-related education a reality. The Center seeks to increase the access of all Americans, regardless of their aptitudes or abilities, to a high-quality work life that is not only economically rewarding, but also personally fulfilling. We seek to enable vocational education to shape (rather than react to) debates over the role of all education. The Center is located at the University of California at Berkeley. Through a network of subcontractors at Columbia University, RAND, the University of Illinois, the University of Minnesota, and Virginia Polytechnic Institute and State University, and its host site, the Graduate School of Education at Berkeley, NCRVE is committed to providing the following services in addition to its research agenda: dissemination, technical assistance for planning and evaluation, JTPA and vocational education coordination, leadership development, inservice education, technical assistance to special populations, and materials distribution. This publication is part of our commitment to those on the front lines of vocational education, struggling to create a new vision.

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HIGH SCHOOLS WITH CHARACTER: Why Might They Be Important?

If high schools with character work better than conventional high schools, why might this be important?

Charles S. Benson, Director of the National Center for Research in Vocational Education, defines high schools with character and addresses the issue of their importance in a recent NCRVE publication.

His paper discusses "approaches to educational reform of American secondary schools that build upon pedagogical strengths of vocational education, while at the same time seeking to transform both academic and vocational education into a new and much more powerful synthesis of instructional practice."

Benson describes the secondary school reform movement of the 1980s (now continuing into the 1990s) as having been built on four pillars:

- longer school days,
- longer school years,
- more rigorous standards for high school graduation, and
- heightened requirements for entrance to college.

The main assumptions of that educational reform movement are, as he sees it:

- Standards of instruction and student performance outside the college prep track are grossly inadequate.
- The academic content of the college prep track would serve the needs of virtually all students if those students could master it.
- For most students to master the college prep curriculum, more study time is required.
- Student motivation to study must be heightened.
- But no change is required in "approved instructional practice," meaning the ways that students and teachers do their work together in the college prep track.

Benson then compares and contrasts this approach to educational reform of secondary schools to the "high schools with character" approach. He credits Paul Hill of RAND with coining the term and uses the acronym HSC.

Charles S. Benson

The HSC and the conventional approach to high school reform agree that standards of instruction outside the college prep track are deplorably low; that the school day and school year should be lengthened; and that student motivation is a major problem. And, Benson adds, "I would emphasize that differences between traditional reform and HSC are not about academic rigor."

The differences, as Benson sees them, are twofold. "First, the HSC group does not hold that the conventional college-prep curriculum would serve the needs of virtually all students, even if virtually all students mastered it. The main reason for this position is the difficulty that many people have in transferring college prep learning from the classroom to their lives as workers and citizens.

"The second point of difference...is to assert that high schools can serve the large majority of students successfully if, but only if, profound changes are made in the ways that learning materials are presented, in the ways that students and teachers do

their work together, and in the provision of a strong element of 'character' or 'focus' in the identity of a high school."

Benson adds, "I would emphasize that differences between traditional reform and HSC are not about academic rigor."

These points of difference, says Benson, lead to the four pillars of high schools with character:

- integration of academic and vocational studies,
- cooperative learning on the part of students,
- collegial work on the part of teachers, and
- a special school identity, commonly established through an industrial connection.

To Benson, the first pillar, integration, means "revising processes of instruction such that academic programs display bountiful applications of theory, i.e., what the theory is used for, while at the same time the vocational programs incorporate theory that supports the practical skills that are being learned. In the ultimate case, the distinction between academic and vocational teachers vanishes."

Benson says that Ellen Russell, former principal of the Chicago High School of Agricultural Science, a high school with character, dared him "to visit classrooms in her school and then tell her which teachers were in which category, academic or vocational."

"She won," he says.

Cooperative learning, the second pillar, means that students spend a "not-negligible proportion of

CHARACTER IN HIGH SCHOOLS BUILT THROUGH INDUSTRY CONNECTION

"I was able to visit two vocational schools in Washington, D.C. The first had mainly a male student body and offered instruction in a variety of fields: auto body, auto mechanics, construction trades, and some others. The labs, at least during the time of my visit, appeared to be very much under-utilized. Faculty pointed to a number of problems: loss of faith in the value of vocational education, parents uninterested in trying to get their children to attend school regularly, bad academic preparation of students through middle school, inadequate equipment and supplies.

"In contrast was a second school serving mainly female students, with concentration on the health professions. The second school was very busy and it was an exciting place to be. Groups of students were leaving to attend a kind of internship program in a nearby hospital and other groups were returning. There was a lot of comraderie among students and between students and faculty. The course in anatomy seemed to meet a good standard of intellectual rigor. The principal explained that she and members of her faculty visited certain elementary schools several times each year to interest students in a career in health. They also visited the middle schools linking the elementary to the high school to encourage middle school faculty to see to it that students interested in health careers took prerequisites of Algebra I and Biology, in order that they could do well in the hard courses they would meet in high school.

"Both schools were inner-city and both were minority. One appeared to be successful and one not. Plainly, the principal's leadership was important in the apparent success of the health-related school, but the industry connection helped give her leadership a focus and gave point to her relations with the elementary and middle schools from which she drew her students."

The above anecdote was taken from the NCRVE working paper, *Current State of Occupational and Technical Training: The Need for Integration and High Quality Programs.*

school time working in groups, most often on group projects." He described one.

"At Thomas Jefferson High School for Science and Technology in Alexandria (a high-end example of an integrated program/cooperative learning), I visited with a group of six students working in a dark room on laser experiments. The instructor was not in evidence during the time of my visit, but the students were clearly engaged and closely involved in their work. As they watched the laser beams go through their gyrations, they posed a constant stream of questions to each other and seemed to reach tentative agreement on how to move the experiment to a higher stage of analysis Some of the student projects in Thomas Jefferson are related to actual R & D work in the labs of the high tech firms in Northern Virginia."

Integration of academic and vocational studies must be based on collaboration among teachers.

Integration of academic and vocational studies must be based on collaboration among teachers. In schools that appear to have advanced farthest along the path to integration, NCRVE researchers find an important precondition of success; namely, that almost all teachers in the school have a single time in the week to meet and work together as a whole school group. And advanced forms of integration afford "clear examples of collegial performance: team teaching by academic and vocational faculty, joint design of programs, collaborative efforts in writing problem sets and other instructional materials, common efforts in devising new schemes of student assessment."

The fourth pillar of reform for high schools with character is the establishment of a special identity. There are distinct advantages to establishing this "character" through industrial connections, says Benson.

1. Work experience programs that are designed jointly between schools and employers, with mentors provided in the workplace, are more likely to afford students a positive impression of work and to show the importance of applying cultivated intelligence to work tasks.

2. The industrial connection will help students relate their cooperative learning projects to R & D activities, or to similar activities in real workplaces.

CHARLES S. BENSON—A BRIEF PROFILE

Charles S. Benson, director of the National Center for Research in Vocational Education, a position he has held since 1988, is an economist who applies his financial expertise to education-related problems.

He has taught economics at Bowdoin College and been an Assistant Professor of Education at Harvard. He has been a Professor in the Graduate School of Education at the University of California at Berkeley since 1968, and continues serving graduate students in addition to his administrative work at the Center.

His vita lists a variety of consulting jobs both inside and outside the U.S.: with the Ford Foundation and the Carnegie Corporation, the U.S. Agency for International Development (taking him first to Egypt, later to Pakistan), and the World Bank (a project on Nigeria and vocational education). He has also gone to Bangladesh, Indonesia, Columbia, and recently Bulgaria. From 1978 to 1981 he was Principal Investigator in a Study of National Resource Distributions in Vocational Education. From 1979 to 1982 he was a member of the President's Advisory Panel on Financing Elementary and Secondary Education.

Benson attended public schools in Atlanta and received his A.B. (honors in economics) from Princeton and his M.A. and Ph.D. (economics) from Columbia University.

3. The industrial connection improves the probability that teachers will help students develop a "strong understanding of all aspects of the industry they expect to enter," an important requirement in Perkins II for the uses of federal funds.

4. Close industrial connections improve the chances that enterprises will donate equipment and services of mentors to school programs.

If these high schools with character work better than conventional schools, why might this be important in educational reform? Benson answers:

"One of the primary values in American education is equality of opportunity. . . .Obviously, public schools cannot accommodate to microscopic differences in learning, but if there is a substantial proportion of students who can perform better in high schools with character than in the traditional college-prep programs, then *the establishment of such schools would improve access to learning and would be a major gain in making equality of opportunity a reality.*

"High schools with character are not necessarily more expensive than regular schools, especially if the school obtains some equipment and supplies from its industry connection. If these specialized schools developed a good record in curbing drop-outs, offering courses in which students progressed to higher levels of academic rigor, and provided, eventually, higher test scores, the public schools would have the opportunity to restore public faith in the educational enterprise."

A third reason, according to Benson, is relevant *to meeting the needs of the economy.* To avoid the possibility of falling into a "low-skills equilibrium" (where the top levels of skills in our country fall below standards of competencies of workers in Europe, Japan, and the East Asia economic scene), "schools should seek to send into the workforce people who can combine three roles—that of worker, learner and teacher. High performance firms seek workers who can identify and solve problems, deal comfortably with abstractions, perform the mathematics of quality control, and gain comprehensive understanding of the operation of a whole systems of production."

"Schools should seek to send into the workforce people who can combine three roles—that of worker, learner and teacher."

Benson proposes that "we should establish a 'national skills strategy,' under which (a) we reach agreement on national economic goals of the highest priority, of which international competitiveness might be one and (b) determine which kinds of work skills are essential to meet those goals."

He also proposes that "the skills strategy be complemented by a 'training strategy.' The training strategy would attempt to evaluate alternative processes for developing the skills identified for priority treatment in the given planning periods."

Benson's paper is entitled *Current State of Occupational and Technical Training: The Need for Integration and High Quality Programs.* ■

(For complete report, order # MDS-382)

AN UNCOMMON EDUCATION: Interaction and Innovation

Some practical recommendations for schools attempting to integrate secondary vocational and academic education are contained in a recent National Center for Research in Vocational Education report entitled *An Uncommon Education: Interaction and Innovation*.

The recommendations grow out of a research project involving two high schools, one an urban site (Humboldt High School in St. Paul, Minnesota) and one a rural site (New Richmond Public School, a comprehensive high school in Wisconsin).

The researchers recommend (and the following is taken verbatim from the report):

1. In order to get the most out of collaboration between vocational and academic teachers, be modest in your beginnings, and increase the complexity of the project in a stepwise way. Start with two, possibly three, teachers. As you talk about possibilities of collaboration among the subject matter in your courses, be mindful when and where teachers of other subject matter areas might be involved. Add each new voice to the project as it is needed.

2. What are the signs that it is time to add another teacher to a collaboration? Watch for two signs. The first sign is a secure feeling by teachers that they will be able to move ahead with success. The second sign is questions which arise out of the problem of study which would benefit from the knowledge of one or more additional vocational and/or academic subjects.

3. Allow for educational serendipity in planning and practice. The results of collaborative intervention will only be obvious after the fact. The more teachers and students learn about their fields of interest, the more they can learn. One teacher has seen one part of the picture; the other has seen a different part. As they talk about their own reality, it causes a spark—educational serendipity—the blinders are removed, the margins pushed aside. The point is not to say, "There, now I've got it right"; rather, the point of collaborative intervention is to say, "Next time we try this I think we will..." Continued questioning and curiosity are means to an end and an end in themselves.

4. Working together as academic and vocational teachers does not mean "turning your back on" or ignoring specific skills, be they vocational or academic. The uncommon education described in this report is not a zero-sum game. Rather, teachers and students, by working together, gained in general education, and the interaction helped to sort out what was important in the curriculum.

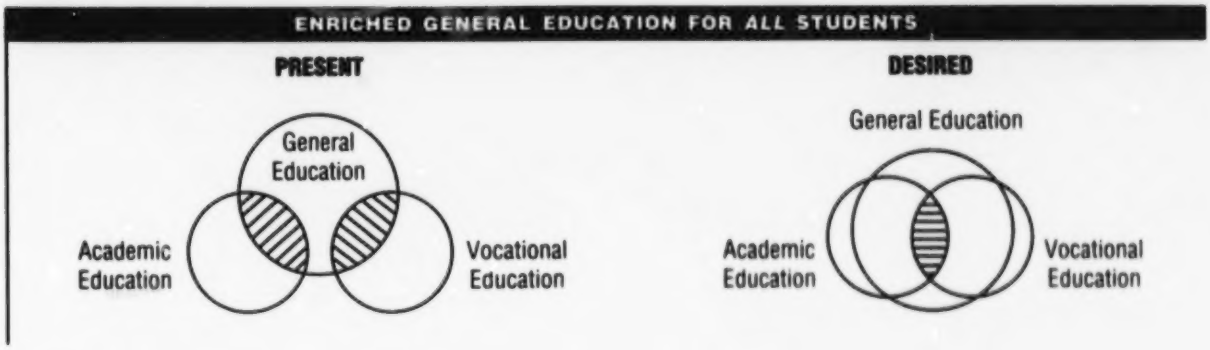
5. Become aware of and try to understand the framework for the proposed subject matter of vocational education and the role of collaboration as a way to enter the conversation about these matters, develop your own perspectives, and shape further directions. One approach would be to attend workshops devoted to these and related issues.

While the recommendations are necessarily general, there are many specific and exciting examples of "educational interventions" and collaborations offered in the report. For example:

At one school, the Macintosh computer laboratory in the industrial technology area became the center of several collaborations initiated by the industrial technology teacher. Using an active outreach strategy designed to reach teachers and students who were unfamiliar with the graphic arts

INTERACTIVE AND PROCESS MATRIX INTEGRATING VOCATIONAL AND ACADEMIC SPECIALTIES

ACTORS	OBJECTIVES	MEANS	OUTCOMES
	Purposes and aims	The act or process	Objectives reached: Assessment by achievement, performance tests, and other
Administrators	To increase collaboration, enhance the general satisfaction of students, and lessen academic failure, dropout, and negative types of behavior.	Advocating collaboration. Providing resources. Providing time for collaborative planning. Rewarding collaboration (e.g., supplies, sabbatical, study leaves).	Different volume and mix of students and teachers in vocational and academic fields. Heightened staff morale. Lessened student dropout and destructive behavior. Increased degree of teacher and student communication, cooperation, and collaboration.
Teachers	To enrich the general education students. To enrich the general education teachers. To gain a deeper understanding of the possibilities of subject matter. To exercise the skills of communicating, cooperating, and collaborating.	Time for planning. Time for doing. The willingness to collaborate. Supplies and facilities (e.g., room, books).	Active student involvement and interest. New things learned by students. Student intention to continue in studies. Greater teacher/student collegiality and teacher/teacher collegiality. Exercise in cooperation. Appreciation for academic collegiality as important for continuing professional/general education.
Students	To increase sense of schooling.	A greater willingness and ability to cooperate. A willingness to work and attend classes. Increasing communication and cooperation with students who have different goals.	Observation of teacher/teacher collaboration. Learned self-confidence. Continuation of studies or jobs. Greater teacher/student and student/student collegiality.
Consultants (Researchers)	To understand more fully the meaning of general education. To learn more about facilitating collaboration.	Observation and reflection of the efforts at cooperation, communication, and collaboration.	A fuller understanding of general education. Thoughts on future implementation.



curriculum, the teacher developed a group of services called "Academic Technology."

...teachers and students, by working together, gained in general education, and the interaction helped to sort out what was important in the curriculum.

During the first period of the school day, the graphic arts teacher served as a technology specialist for a number of academic teachers and their students. College preparatory students wrote and produced business letters (a district graduation competency requirement); special education students wrote and produced a newsletter about their program; and intermediate graphic arts students served as peer tutors.

During the seventh period of the day, geometry students planned to design and produce printed logos using abstract geometric concepts. Scheduling problems prevented the mathematics teacher from coming to the laboratory with students, and the geometry students did not have the prerequisite computer software skills to work independently. The math teacher planned to purchase and install a Geometric Supposer program on the system. With this, the geometry students would be able to participate in the technology laboratory.

In addition, all seventh grade introductory graphic arts students learned technical reference skills from the gifted and talented teacher. Utilizing the resources of the public library, the students chose topics, located and read current technology reference materials, and wrote and produced individual reports. These reference skills will remain a part of the Industrial Arts curriculum; they also satisfy a district graduation competency requirement.

According to the observations of the researchers, several factors helped make the collaborations successful: the flexibility of the teachers, the student-centered classrooms, and the project-centered structure of the classrooms. The complicated scheduling for these collaborations was facilitated by the school administration. The intermediate and advanced vocational students, who acted as peer tutors, helped inexperienced students to be successful with the computer hardware and software. The industrial technology teacher encouraged a heterogeneous mixing of students. For example, disabled students served as peer tutors for the students from an English class.

The research and NCRVE report are the work of Robert H. Beck, George H. Copa, and Virginia H. Pease of the University of Minnesota. ■

(For complete report, order # MDS-140)

Two NCRVE reports which relate to this publication are: *Subject Matter of Vocational Education: In Pursuit of Foundations* by George H. Copa and E. Tebbenhoff (Order # MDS-094) and *Vocational Preparation and General Education* by Robert H. Beck (Order # MDS-198).

COMMUNITY COLLEGE CONTRACT INSTRUCTION: Complex Issues

Some 94 percent of public community colleges offered at least one course on a contract basis to public or private employers during the 1988-89 academic year.

This is just one of the findings in a survey which attempts to assess the scope and nature of contract training and other activities related to economic development at the nation's nearly 1,000 public community and junior colleges and technical institutes.

The national survey of a sample of the institutions was undertaken by the American Association of Community and Junior Colleges in conjunction with the National Center for Research in Vocational Education. The NCRVE report, *Community College Involvement in Contract Training and Other Economic Development Activities*, presents the major findings of the survey.

The issues surrounding contract education are complex, and often not fully debated. According to the report, contract training seems to offer something for everyone.

- Educational institutions strengthen their connections to employers and enhance their community service.
- Individuals receive training appropriate to their employment.
- Businesses benefit from better-trained employees, and may have some of their training costs subsidized.
- Communities benefit from economic development.

On the other hand, there are potential drawbacks as well, particularly since contract training represents short-term and specific training rather than the broader education that community colleges have emphasized, and because contract training may represent ways for employers to gain public subsidies without any guarantee that either employees or communities benefit.

The issues surrounding contract education are complex, and often not fully debated.

Other important findings of the survey are as follows:

- Despite the large proportion of colleges that provide some contract training, most colleges have relatively modest contract education programs. The number of courses offered at the median college was only 50; the median number of students enrolled was 919; and the median number of employer clients served was 24. At most colleges, enrollment in contract classes is only a small fraction of enrollments in regular credit courses.
- Frequently offered contract courses deal with job-specific skills (offered by 93 percent of the colleges), followed by courses in basic reading, writing, and math skills (offered by 60 percent of the colleges), "other" miscellaneous courses (offered by 46 percent of the colleges), and academic courses that are tied to apprenticeship programs (offered by 35 percent of the colleges).
- Courses focusing on job-related skills are more likely than other contract courses to be customized—that is, developed specifically for the employer rather than taken "off-the-shelf" from the regular college curriculum. On

PROPORTION OF COLLEGES OFFERING CONTRACT TRAINING DURING 1988-89	
Type of Contract Training	**Percent of Colleges Providing Training**
■ **Job-specific skills training** designed to provide the skills or knowledge needed to perform a job, improve current performance, or prepare for advancement	**93%**
■ The academic or general education portion of **apprenticeship programs**	**35%**
■ Courses in **basic reading, writing, or math skills**	**60%**
■ **Other courses** that do not fit into any of the above catagories (examples include academic courses that are not part of apprenticeship programs, as well as recreational, health, or other personal interest classes)	**46%**

average, approximately 67 percent of the job-related courses offered per college were customized, as opposed to only 27 percent of all other courses.

- Colleges often collaborate with their clients in the development of customized courses. On average, 61 percent of the job-specific courses offered were developed jointly by colleges and their clients. Other courses, including basic skills and academic courses, are more likely to be taken "off-the-shelf"; only 46 percent were developed jointly, and the remainder were developed solely by the college.

- Employers themselves provide the largest share of revenues need to support contract education, followed by subsidies from state and local governments.

- Community colleges engage in many other non-instructional services to the business community, though these services are not as widespread as contract training. Approximately one-third of the colleges provide special services to small business, 18 percent help businesses obtain funding or loans, and approximately 13 percent help businesses in contract procurement.

- During 1988-89, approximately 80 percent of the public community, technical, and junior colleges received funds through the Vocational Education Act (VEA). Approximately two-thirds of these monies were used to support credit instructional programs; another 17 percent was devoted to non-credit instruction, and the remainder was used for other activities.

- Approximately 50 percent of the colleges received Job Training Partnership Act (JTPA) funds, and 20 percent served as regional administrative agencies for JTPA.

- During 1988-89, approximately 50 percent of the colleges participating in the survey received funds from other state, local, and federal agencies that support business assistance programs or vocational training. Like the amounts of VEA and JTPA funds, the sources per college from these agencies vary widely.

The survey was sent to a random sample of colleges, with a completion rate of 72 percent, representing an adequate cross-section of public community, technical, and junior colleges.

The researchers found that the results allay several possible fears about contract education. While

contract education has become widespread, in most institutions it remains a limited program with relatively restricted enrollments compared to the regular credit courses, and it is far from being a big money-maker. *There is little danger at this point of having the traditional vocational and academic missions of community colleges undermined by contract education.*

"Economic development" is still a slogan without much definition.

In addition, it is relatively clear that there is substantial collaboration between colleges and their clients about contract education. Only a minority reported that courses were developed entirely by employers; in the majority of cases there is collaboration in the development of courses, as well as sharing of equipment and facilities. While there is extensive customization, particularly in job skills courses, there is also considerable use of the regular courses offered by community colleges and technical institutes. *This suggests that a good deal of contract training provides opportunities to combine relatively employer-specific content—in the customized components—with more general content (including basic skills instruction).*

Finally, the fear that employers are using contract education as a way of getting public funding for their specific training seems unfounded. According to this survey, employers are the largest single source of funding for contract education and provide a majority of funding in 42 percent of institutions. They also provide in-kind contributions in the form of donated equipment and the use of facilities. While there still may be cases where employers manage to get community colleges to provide private training wholly at public expense, this situation cannot be typical.

The researchers reported that other issues surrounding contract training remain "murky" because colleges have not collected much systemic data on the scope and effects of contract instruction programs. They mention specifically that there is virtually no information about the effects of contract training for either the individuals enrolled or for the employers who sponsor them.

They also suggest that the role of contract education in economic development remains unclear. "Economic development" is still a slogan without much definition. The conditions under which employment increases occur in a region—whether increases represent "smokestack chasing," which reduces employment in other regions, or a net gain in employment—and the role of short-term training in encouraging either type of increase is uncertain.

But they conclude that contract education is clearly here to stay; it is widespread, and its potential benefits to students, employers, and postsecondary institutions are substantial.

The report was prepared by Robert Lynch of Cantonsville Community College, Baltimore, Maryland; James C. Palmer, former director of Data Collection and Policy Analysis at the American Association of Community and Junior Colleges, now at the Center for Community College Education, George Mason University, Virginia; and W. Norton Grubb, NCRVE site director at the University of California at Berkeley. ■

(For complete report, order # MDS-379)

SET AND JAM WORK SYSTEMS: Implications for Education

Recent research on employment practices in the United States has described an emerging employment system characterized by (1) a high degree of employment security based upon flexible job assignment, (2) employee involvement in problem solving and continuous improvement, and (3) continuous training of all employees.

A new National Center for Research in Vocational Education report looks at this work practice, which it labels the SET system (Security, Employee involvement, and Training), contrasts it with JAM (Job classifications, Adversarial relations, and Minimal training), and discusses the implications for education.

JAM is the employment system that has prevailed in most unionized firms during the past fifty years. Security is determined by seniority within a narrowly defined job classification, employee involvement is impeded by a traditional adversarial relationship between union and management, and firms make only a minimal investment in training hourly employees.

At JAM institutions, workers have well-defined specialized tasks, and they move up a ladder of job titles differentiated by small increments in pay and other desirable characteristics. Pay is based on seniority, since seniority determines job assignment. The union bargains production standards (i.e., work speed) and work rules for job assignment. "Quasi-security" for senior workers exists because layoffs are based on seniority. The union and company have an adversarial relationship in which the union uses the grievance system, work rules, and work stoppage as its basis of power, while the company uses worker discipline, automation with declining employment, or plant closure as its basis of power.

The research, based on case studies, found that strong employment security practices exist at SET companies, and repeated decreases in the workforce and weakening of employment security provisions exist at JAM companies.

The three elements of SET are also central to what has been described as the prevailing system in large Japanese firms. Training, use of teams, continuous skill upgrading, and high levels of employment commitment are not, of course, universal in Japan. Nor are they uniquely Japanese features, as they are elements of successful European experiences as well.

American firms, both with and without unions, are being urged to move toward SET on the grounds that SET will make U.S. producers more competitive in the world markets, maintain high wages and living standards, and provide more satisfying working conditions as well as a more equitable distribution of employment and income.

The diagram suggests how the three elements of SET reinforce each other, in theory. Employment security enhances employee involvement because employees are more willing to contribute to improvements in the work process when they need not fear losing their own or their coworkers' jobs. Employment security contributes to training as both employer and employee have greater incentives to invest in training. At the same time, training reinforces employment security because more highly skilled workers will be more productive and adaptable to new conditions, and training strengthens employee involvement because better trained workers have more ideas to offer. Employee involvement contributes to increased training by making the need for situated learning more evident and by increasing employees' interest in training. Finally, employee involvement also enhances employment security as higher productivity and quality make the company more competitive.

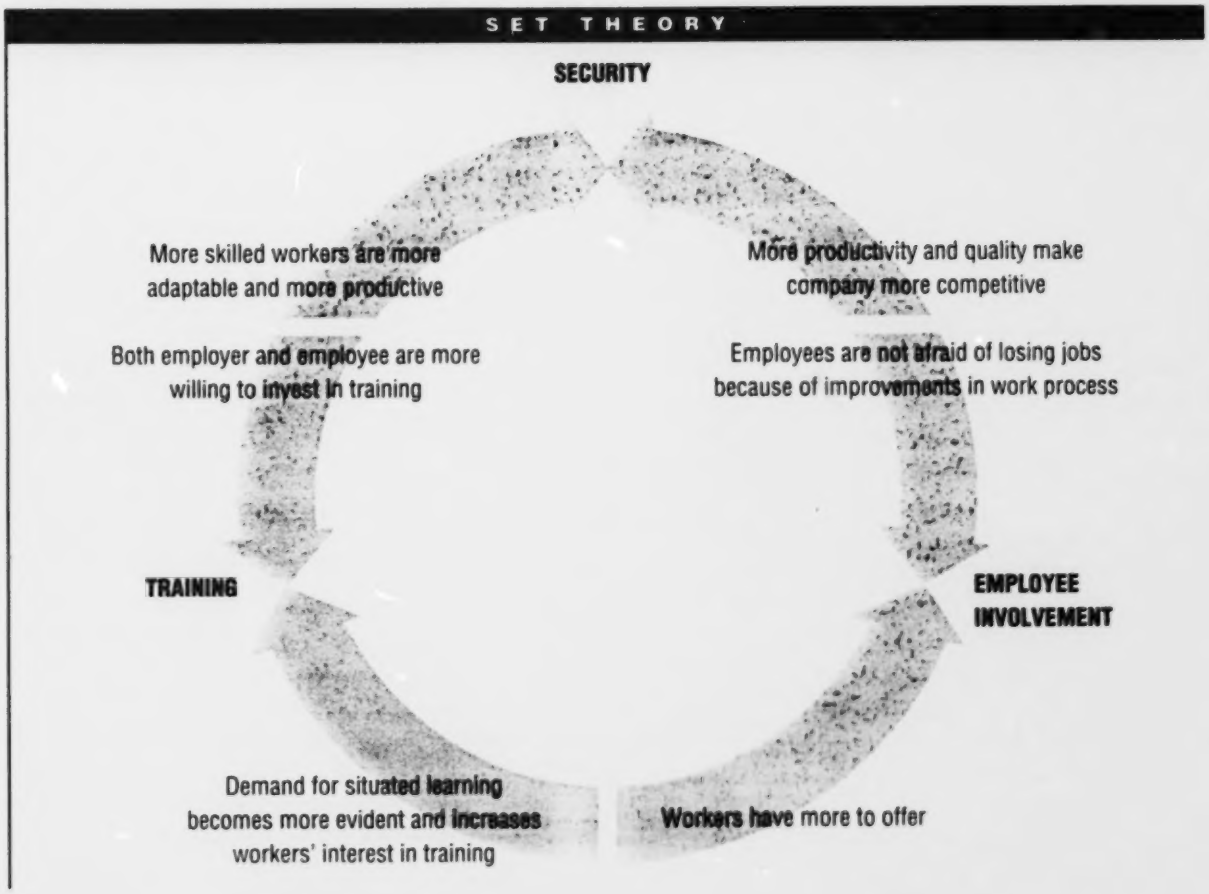
The absence of any one element of the SET system weakens the others. This interdependence explains why the many companies that have tried to institute only individual elements of SET have had mixed experiences. Apparently, the transition to SET cannot be done in small incremental steps, as it involves a willingness to invest considerable resources in a substantial reorganizing of both production and employment systems.

One case study was of a company with the pseudonym Together Manufacturing. It is a unionized company, formed as a joint venture of an American and a Japanese company. It makes consumer durables and employs approximately 2,500 people. It has been widely recognized for its effective use of the SET system, achieving outstanding results in labor productivity and product quality.

At Together, all employees work in teams, each of which practices job rotation, quality control, continuous improvement, and systematic problem solving. One new cognitive task assigned to team members at Together involves standardizing their own jobs. In traditional large-scale manufacturing, this kind of analysis is done by engineers. At Together, company industrial engineering has been replaced by employee involvement.

Job rotation requires team members to learn each of the several jobs the team performs.

The management at Together Manufacturing emphasizes the importance of team members' suggestions for continually improving quality and reducing costs. In 1988, more than 70 percent of team members participated in the company's formal suggestion program; this is high by U.S. standards.


SET THEORY
SECURITY
More skilled workers are more adaptable and more productive
More productivity and quality make company more competitive
Both employer and employee are more willing to invest in training
Employees are not afraid of losing jobs because of improvements in work process
TRAINING
EMPLOYEE INVOLVEMENT
Demand for situated learning becomes more evident and increases workers' interest in training
Workers have more to offer

BEST COPY AVAILABLE

Together pays employees for suggestions that reduce cost, improve product quality, or enhance workplace safety.

The researchers found that companies that have successfully instituted SET systems have put all three parts of the SET triangle in place. Instead of organizing work so that employees do a single task in a production process, monitored by a supervisor, companies are asking workers to be parts of active, semi-autonomous teams, to be involved in problem solving, job rotation, quality control, and continuous improvements. These new systems require some cognitive skills such as an ability to write suggestions or to perform elementary statistical analysis or detect patterns. More importantly, however, the new systems involve qualitatively different skills such as relational capacities for working in or leading a team, and qualitatively higher commitments between the workers and the company.

This research suggests three kinds of implications for schools.

These pertain to the teaching of students in initial education, further education and training of adults, and the restructuring of the work process within schools themselves.

With regard to the teaching of students during their initial schooling, K–12 and postsecondary, the description of the SET system reinforces the current widespread interest in making sure that students develop general capacities for problem solving, communication, and continued learning. In addition, successful participation in a SET system requires positive motivation to think constructively about problems at work and how to make improvements in work processes. To develop these capabilities and motivations presumably requires a more team-based, project-oriented, problem-solving method of instruction. It would also be beneficial to include more school-supervised work experience in the curriculum, so that students can practice learning in the workplace.

In addition to preparing students for their future work, schools also have a role to play in helping currently employed adults adapt to changes in their workplaces. Community colleges are already active in upgrading basic literacy, teaching generic work skills such as communication and problem solving, and providing technical training for adults whose jobs are now demanding new or higher levels of skill and knowledge.

What is clearly lacking for most teachers is employee involvement.

Finally, SET can serve as a model for restructuring the work of teachers in schools and colleges. Most teachers already have greater employment security than other occupations, so this element of the model is already in place. Teachers also have relatively abundant opportunities for continued training, and in most K–12 school districts, teachers can earn higher salaries as they accumulate postgraduate educational credits, so the training element also seems to be in place. What is clearly lacking for most teachers is employee involvement. In particular, teachers are seldom organized into semi-autonomous work teams. Currently, many efforts to "restructure" school governance are attempting to give groups of teachers more decision-making authority over such matters as curriculum, instructional materials, scheduling, evaluations of peers, and budgets. Teachers engaged in these experiments may also take more control over their own professional development, so that their continual training becomes more immediately relevant to improving the instructional process.

Moreover, it seems likely that teachers who are themselves employed in a SET system will be more able to prepare students for that kind of work situation.

The research and NCRVE report *Skills and Security in Evolving Employment Systems: Observations from Case Studies* are the work of Clair Brown, Michael Reich, and David Stern of the University of California at Berkeley. ■

(For complete report, order # MDS-131)

A NATIONAL DATABASE ON VOCATIONAL TEACHER EDUCATION

A recent publication of the National Center for Research in Vocational Education is a 228-page volume which is intended "to overcome the present lack of knowledge about where, when, what, how, to whom and by whom vocational teacher education is provided."

Offering lists, charts, and diagrams, *A National Database on Vocational Teacher Education* presents information and data primarily about the institutional and administrative milieu in which vocational teacher education takes place, the professors of vocational education, and salient curriculum and instructional parameters.

Teacher education seemingly has moved to the center stage of the educational reform movement based on the grounds that school improvement must begin with the upgrading of teacher quality. But few of the reform mandates seem to be based on any substantive body of research or knowledge base—in fact, little research has been conducted on teacher education. This seems surprising in that teacher education programs comprise a relatively large percentage of enrollments at over 70 percent of our nation's colleges and universities.

While the body of research on teacher education in general tends to be limited, research and data on vocational teacher education seem to be practically nonexistent. Even the recent research efforts initiated to gain a better understanding of teacher education and teacher educators have not included or have failed to segment data specific to vocational teacher education.

The book produces some interesting facts. For instance, it states that "much vocational teacher education takes place out of the traditional realm of college or university study. Perhaps as many as 73 percent of trade and industrial education beginning teachers and 50 percent of health occupations beginning teachers do not receive preservice teacher education from a college or university; rather, they receive their teacher education from state-sponsored inservice education or from the employing agency itself. Thus, much of preservice vocational teacher education is not university based."

And even some university-based preservice teacher education is designed to meet state certification minimal course requirements; this is in contrast with planned, cohesive, and typically accredited programs of study leading toward a baccalaureate degree in education.

...few of the reform mandates seem to be based on any substantive body of research or knowledge base—in fact, little research has been conducted on teacher education.

Graduates of preservice vocational teacher education declined overall from 1987 to 1989, and the decline needs to be analyzed further, especially since enrollments in teacher education programs nationally are enjoying a general upswing.

Contrary to some speculation in the literature, the data presented suggests that the faculty in vocational teacher education are relatively stable, well educated, and occupationally experienced, and tend to profile favorably and relatively similarly with a profile gleaned from findings about secondary education professors. Some 75 percent of secondary education faculty are tenured, compared to 68 percent of vocational teacher educators. The average age for secondary professors is 53 compared to 49 for vocational education. A larger percentage of vocational teacher educators have doctoral degrees than do their secondary methods counterparts. Virtually all teacher educators have

considerable teaching experience and nearly all vocational teacher educators have occupational experience.

The report indicates that it is not possible to determine the extent to which curriculum parameters for vocational teacher education programs have changed as a result of reform efforts. "However, anecdotal evidence and some data from this study's institutional and professors' surveys would indicate that on the national level, significant changes have not been made."

The greatest change in vocational teacher education in the past few years—at least at the national level—has probably been to stiffen requirements of admission into teacher education. Grade point averages have been increased (to 2.50), a minimum score is often required on a basic skills test, and other requirements have been imposed to monitor the "quality" of those who might become teachers. A second possible change at the national level may have been to increase the credit hours and time devoted to student teaching or other clinical-type experiences with the public schools.

The data gathered should help better inform and guide the providers and pertinent decision makers in improving vocational teacher education within a context of educational reform. The data should also be used as a basis from which to launch more specific and informed studies on teacher education in vocational education.

The report was prepared by Richard L. Lynch when at the Virginia Polytechnic Institute and State University. Presently he is at the University of Georgia. ■

(For complete report, order # MDS-121)

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NCRVE **Change Agent**

Volume 2, Number 2, Summer 1992 National Center for Research in Vocational Education

ABOUT NCRVE

The Center is established under authorization of the Carl D. Perkins Vocational Education Act to conduct applied research and development in vocational education. Our mission is to engage in research and service activities designed to make a new vision of work-related education a reality. The Center seeks to increase the access of all Americans, regardless of their aptitudes or abilities, to a high quality work life that is not only economically rewarding, but also personally fulfilling. We seek to enable vocational education to shape (rather than react to) debates over the role of all education. The Center is located at the University of California at Berkeley. Through a network of subcontractors at Columbia University, RAND, the University of Illinois, the University of Minnesota and Virginia Polytechnic Institute and State University, and its host site, the Graduate School of Education at Berkeley, NCRVE is committed to providing the following services in addition to its research agenda: dissemination, technical assistance for planning and evaluation, JTPA and vocational education coordination, leadership development, inservice education, technical assistance to special populations, and materials distribution. This publication is part of our commitment to those on the front lines of vocational education, struggling to create a new vision.

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HEALTH CARE PERSONNEL SHORTAGES AND VOCATIONAL EDUCATION

Meeting the future needs of the San Francisco Bay Area for health care professionals will require growth in existing educational programs. This can be accomplished through expanding current offerings, establishing new programs, and creating night and part-time educational opportunities. Meeting these needs will also require long-term program planning and curriculum innovation to identify and meet the personnel and skill needs of the health care industry.

This is a summary statement from a report just published by the National Center for Research in Vocation Education. Although the two-year research project was limited in geographic scope to the eight counties surrounding the San Francisco Bay, the study has nationwide implications, since other recent research suggests that nationally, the supply of health care professionals has failed to keep pace with the demand for services.

The health care industry is one of the largest and fastest growing industries in the United States, according to the report, titled *Meeting the Personnel Needs of the Health Care Industry Through Vocational Education Programs*. In 1989 Americans spent $600 billion on health care, or nearly 11.5 percent of the gross national product (GNP). That figure is projected to rise to $1.5 trillion by the year 2000, representing nearly 15 percent of the GNP.

Contributing to this health care personnel shortage are an aging population, growing numbers of immigrants, emerging new diseases such as HIV/AIDS, new medical technologies such as computer tomography (CT) scanners, magnetic resonance imaging (MRI) machines, and bioengineered gene therapies, and a growing emphasis on personal health and prevention.

The report predicts that "during the next decade some of the fastest growing health care occupations will be in fields where education and training typically occur in secondary, postsecondary, and adult vocational programs." These occupations include nurses, medical assistants, home health aides, medical therapists, a variety of medical imaging technologists, and managers of medical records.

In 1989 Americans spent $600 billion on health care... That figure is projected to rise to $1.5 trillion by the year 2000.

Concurrent with these shortages, health care providers—ranging from small nursing facilities to major medical centers—are also under pressure to control costs. Productivity improvements, which often depend on increasing employees' skill levels or reorganizing their job responsibilities, have been one major way of achieving these cost controls. When combined with the demands of new, more complex technologies, this means that employees must have both advanced technical skills and the higher level cognitive abilities to perform effectively in a rapidly changing work environment.

The goal of the NCRVE research was to identify avenues for reducing health care labor shortages through cooperative efforts by health care providers and vocational educators. The research emphasized:

1. Increasing productivity by improving knowledge of the changing skills required for health care jobs;
2. Enhancing occupational mobility by identifying career paths that could be fostered through articulated education programs;
3. Creating links between health care providers and vocational educators that could support ongoing communication about educational policies directed at supporting the health care industry.

The researchers recommend: *Across all educational levels, health care programs need to be expanded.*

Applied academic programs that combine education in academic subjects with concrete work-related experience are one recent innovation that can increase the supply of health care professionals. Expanding and developing new secondary-level health occupations preparation, especially applied health sciences courses, should increase the pool of employees simply by increasing the supply of high school graduates who are motivated to pursue health care careers.

The study also reported that educators from a variety of health care fields confirmed that students with previous experience in health care settings are more successful in occupational training programs. Thus, secondary-level programs which include work options or clinical placements could reduce the high dropout rates which exist in many postsecondary health programs and even in the early years of employment after graduation.

Health occupations programs should be coordinated across all secondary and postsecondary educational levels.

The expansion of coordinated, or articulated, education programs is an important way in which multilevel planning for health occupations programs can increase the supply of health care professionals.

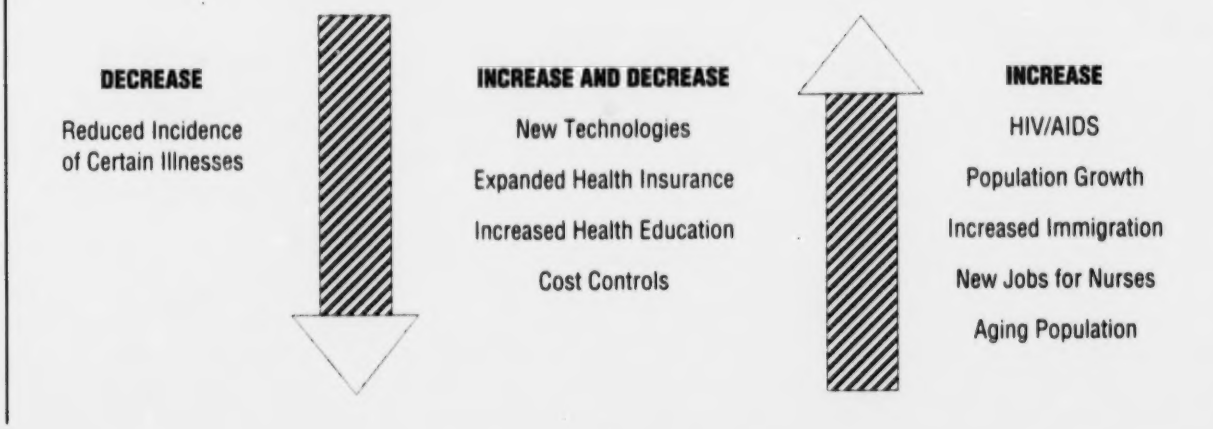
The study reports that "recent efforts in nursing education in California and other states have already produced an excellent model—one in which secondary and postsecondary programs are coordinated to facilitate continuing education for higher degrees and to foster upward occupational mobility by eliminating duplication of course requirements." The most effective of these programs have been based on fully coordinated planning that involves secondary/adult education, community colleges, and four-year institutions.

The report stresses that "it is vital to address the issue of how applied secondary and postsecondary academic programs can also meet the entrance and transfer requirements of four-year institutions."

Survey data collected for the study indicated that employers were generally satisfied with the technical skills training that new employees had received in secondary and postsecondary vocational education programs.

However, employers frequently expressed dissatisfaction with the communications, leadership, and decision-making skills of entry-level employees in a broad range of occupations ranging from nurses and nursing assistants to

Factors Affecting the Future Demand for Nursing Services



physical therapists and physical therapy assistants.

In every occupation studied, employees had assumed greater responsibility for explaining complex procedures to patients, were working with patients who were older or had language difficulties, and were required to produce more complex written documentation. Moreover, in many occupations employees were working more independently from physicians, because significant health care services had been moved out of hospitals or employees were using more highly technical procedures.

Based on their findings, the researchers recommended improving the nontechnical components of health occupations curricula at all levels by increasing the focus on instruction in communications, leadership, and decision-making skills through the implementation of integrated vocational and academic programs.

Meeting the Personnel Needs of the Health Care Industry Through Vocational Education Programs was prepared by Paula M. Hudis, Denise Bradby, Cynthia L. Brown, E. Gareth Hoachlander, Karen A. Levesque, and Stefan Nachuck of MPR Associates in Berkeley. ■

(For complete report, order # MDS-137)

USING POSTSECONDARY TRANSCRIPT DATA

Six years after high school graduation, 71 percent of 1980 high school graduates reported that they had entered some type of postsecondary institution. Some 30 percent had enrolled in two-year institutions, and 13 percent had enrolled in less-than-two-year institutions.

What did they study? A research team at the National Center for Research in Vocational Education set out to answer this question, examining the 1980 seniors' transcript data collected by the National Center for Education Statistics as part of the High School and Beyond study, which gathered information from more than 28,000 seniors enrolled in 1,015 public and private high schools in 1980. A sample of 12,200 were followed up in 1982, in 1984, and again in 1986 to obtain information on topics such as their participation in postsecondary education, their work experiences, and their family status.

The NCRVE study includes all 1980 high school seniors enrolled in less-than-four-year postsecondary institutions in the first four years after high school, regardless of when they entered or stopped attending and whether or not they earned a degree. It includes students with a wide range of educational objectives, including those who hope to transfer to a four-year institution, those who want to earn an associate degree or vocational certificate, and those who have no degree objective.

The great majority of students—82 percent—who attended less-than-four-year institutions were enrolled in public two-year institutions. Approximately 9 percent attended private proprietary institutions; 5 percent attended public vocational-technical institutions; 4 percent attended private less-than-four-year institutions.

General Course Taking Patterns

At public two-year and private less-than-four-year institutions, 91 percent of the students took academic courses, while at private proprietary and public voc-tech institutions only 62 and 60 percent of the students enrolled in academic courses. Not surprisingly, at private proprietary and public voc-tech institutions, 98 and 99 percent of the students took vocational courses.

Some 57 percent of students in public 2-year institutions were enrolled in personal skills, remedial, and avocational courses, with private proprietary

students at the low end with 26 percent personal skills and remedial.

More than 60 percent of students in less-than-four-year institutions took courses in three academic fields: social sciences, letters, and mathematics. In the vocational area, 50 percent of the students participated in business, more than the percentage participating in any other field.

Second to business, the fields that had the highest participation were trade and industry in private proprietary and public vocational-technical institutions, computer/data processing in public two-year institutions, and both home economics and health in private less-than-four-year institutions.

Course-Taking in Public Two-Year Institutions

One section of the report provides a more detailed discussion of students in public two-year institutions—the type of institution attended by 82 percent of the students.

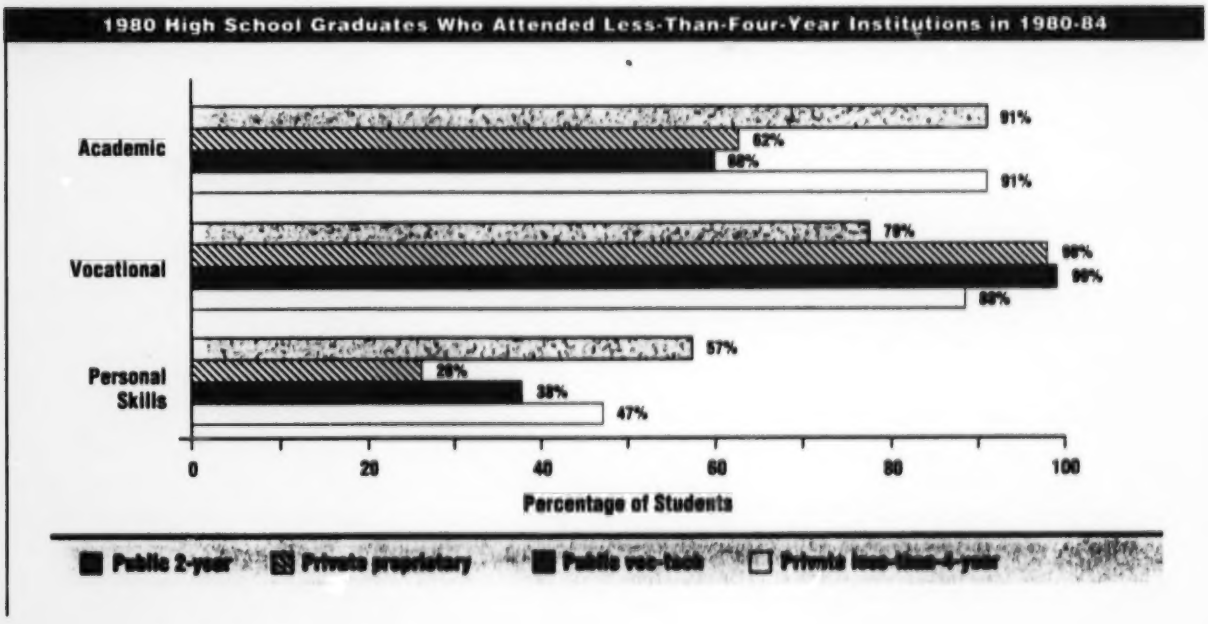
Participation in both vocational and academic fields of study in public two-year institutions was high: 71 percent of students earned vocational credits and 85 percent earned academic credits. Students earned an average of 20 academic credits during the four-year period, compared with 11 vocational credits. Some 50 percent of the students earned personal skills credits, earning an average of two credits.

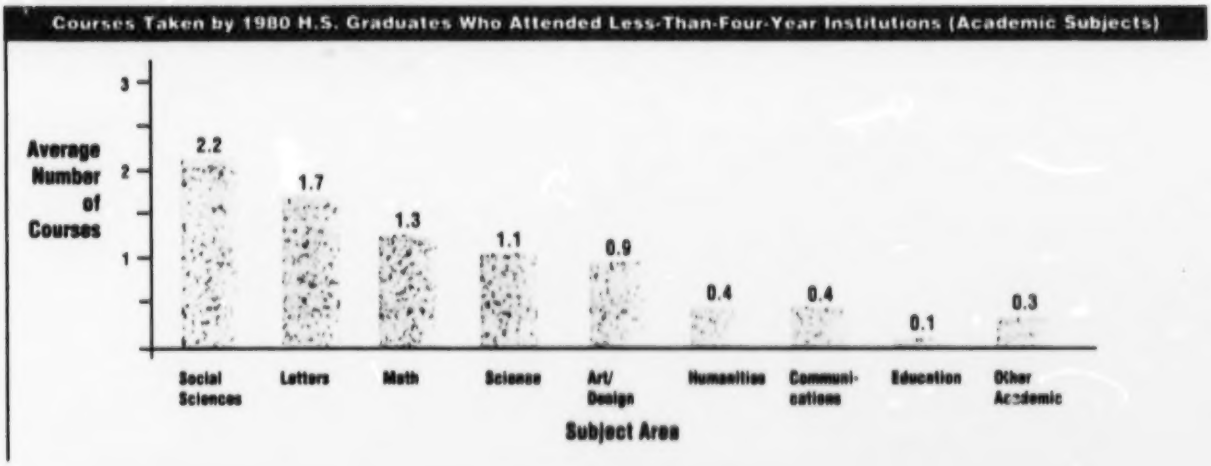
Some 51 percent of all students in public two-year institutions earned 5 or fewer vocational credits, and 29 percent earned no vocational credits. However, the students who earned no vocational credits also completed relatively few academic credits (12.9 on average). On the other hand, students who earned even a minimal number of vocational credits (up to 5) earned an average of 18 academic credits.

Approximately one-fourth of the students completed between 5 and 15 credits. Some 24 percent of the students earned more than 15 credits, with 15 percent earning more than 15 up to 35 credits and 9 percent completing more than 35 credits.

Males and females were equally likely to earn academic credits; however, males were more likely than females to earn vocational credits.

There were racial/ethnic group differences in the average number of credits earned in vocational and academic fields. Black students, for example, earned fewer vocational credits on average (8.0 credits) than white students, who earned an average of 11.3 credits, and Hispanic students, who earned an average of 10.4 credits. The average number of





vocational credits earned by Asians (9.4 credits) was not statistically different from the number earned by black students (8.0). Black students also earned fewer academic credits (14.9 on average) than Asian, white, or Hispanic students, who earned an average of 28.7, 20.3, and 20.0 academic credits, respectively.

The number of vocational and academic credits earned was also related to a student's socioeconomic status. Students with high socioeconomic status earned fewer vocational credits and more academic credits than did students with low socioeconomic status.

There were gender differences in the percentage of students earning credits in mathematics and education. Some 58 percent of males earned mathematics credits (an average of 3.7) compared with 47 percent of females (2.4 credits on average). In the field of education, females participated more than males (7 percent compared with 3 percent) and also averaged more earned credits.

Stereotypical gender differences, both in participation and in credit completion, existed in all vocational fields, except in marketing and communications. Women participated more than men in business, health, and home economics. Men, on the other hand, participated more than women in trade and industry, computer/data processing, engineering, and protective services.

The report, titled *A Guide to Using Postsecondary Transcript Data and an Overview of Course Taking in Less-Than-Four-Year Postsecondary Institutions*, was researched and written by Susan P. Choy and Laura J. Horn of MPR Associates. It has a score of useful charts. ■

(For complete report, order # MDS-378)

NICE PLACES TO WORK: Schools with Exemplary Vocational Education Programs

Schools in which exemplary vocational education programs exist are nice places to work.

They are neat and orderly and conducive to the development of a sense of pride. They are reasonably well-maintained and have adequate resources for staff, equipment, and facilities. Their administrators are people-oriented but have high expectations of themselves and others, and are risk-takers. Faculty are caring and accept student diversity; students have positive feelings about their programs. These qualities hold true whether the institutions are comprehensive high schools, secondary vocational centers, postsecondary technical institutes/colleges, or community colleges.

These are just some of the conclusions of a new National Center for Research in Vocational Education study which sought to provide an understanding of the nature and the operation of the institutions in which exemplary vocational programs exist.

Studies were conducted at 19 institutions in 11 states. All were identified as having exemplary vocational education programs. An analysis of the anecdotal and contextual data collected from the sites yielded a number of general themes, and, for the most part, these themes were consistent across the institutions studied, regardless of their clientele, mission, educational level, or institution type. The themes were classified under the headings of school climate, administration, teacher attributes, student attributes, vocational student organizations, curriculum, support services, and institutional marketing.

School Climate—Ecology

The researchers observed that exemplary institutions were noticeably concerned with the appearance of their building facilities and grounds. There was little graffiti or vandalism.

"Even programs that generated considerable amounts of discarded materials or required large amounts of consumable materials (e.g., welding, autobody, and carpentry programs) were remarkably clean and orderly," according to the researchers.

Perhaps one of the most important findings regarding administrators... was their ability to instill a sense of vision and mission.

Equipment was up-to-date and, in some instances, "state-of-the-art," and the acquisition of needed equipment was considered to be a priority concern of instructors, administrators, and advisory committees. As one faculty member in a postsecondary institution said, "If we need something, we figure out a way to get it." In some cases, industry linkages were developed or called upon to help the school obtain the needed equipment. In other instances, institutions developed arrangements to use equipment at a business site. It appeared that these schools had been able to achieve sufficient levels of funding that enable teachers to concentrate on other instructional concerns rather than worrying about inadequate equipment, supplies, and facilities.

School Climate—Milieu

Morale in these institutions was generally cited as being "good" by both students and teachers. Faculty stated that "This is the best school I've taught in" and "I'm proud to work here," and students commented that "It's like a big family here" and "You just walk down the halls and other students and teachers (who you don't know) will say 'Hi' to you."

Teacher hiring decisions consistently involved considerable input from the current teaching staff. One lead instructor said "I hire all the new teachers in my program." One administrator viewed his role in

the personnel selection process as being much less important than that of the faculty.

Teacher-to-teacher relationships in these schools were observed to be very collegial. Many instances were cited of situations where teachers from other departments or programs provided special assistance to their colleagues.

School Climate—Culture

Schools visited generally had an overt focus on developing and maintaining high quality standards. Staff and students at these schools articulated a view that their school was "the best" of its kind in their region and they wanted to keep it that way.

School climate was enhanced by a strong sense of "mission" in the vocational centers, technical colleges, and community colleges visited. Administrators, teachers, and students in these institutions could readily articulate the purposes of their school or program.

Administration

Major characteristics regarding the administrative teams in the exemplary schools were leadership style, high expectations of self and others, risk-taking, flexibility, and a strong sense of mission and vision.

Administrators in this study considered themselves to be very people-oriented, and interviews with staff members generally confirmed this belief. They tended to delegate responsibility to other staff members, but they also possessed high concern for accomplishing tasks. They expected high performance from themselves and their staff members.

They were willing to take risks and initiate new ventures or projects; frequently, the risks were largely related to funding. For instance, one institution challenged the community to collaborate with them in developing a technology center to bring new businesses into the community. Another school developed satellite campuses in other counties.

These administrators demonstrated an ability to foresee trends or events that would have impacts on their schools, and consequently, they were able to take steps to maximize the positive effects of these events or to minimize the negative effects. One school undertook a major curriculum development project long before the state mandated systemwide change. Another school was able to obtain expensive state-of-the-art equipment for one of their programs by anticipating a manufacturing company's plans.

Flexibility was another trait that faculty members and support staff noted regarding these administrators. They were not locked into traditional or familiar modes of operation, and they encouraged staff to be creative.

Teachers in exemplary programs accepted student diversity.

Perhaps one of the most important findings regarding administrators in exemplary schools was their ability to instill a sense of vision and mission within their faculties, support staffs, students, and communities.

Teacher Attributes

A caring attitude exhibited by instructors was among the most consistent and powerful of the themes identified in this study. One student comment reflected this attitude: "That's what makes me want to come here. If we say 'Oh gosh, we're just dumb' or something like that, the teachers say, 'no, you're not.'"

Teachers are willing to spend time with students or spend time performing duties not usually considered to be part of a teacher's responsibilities. One student told interviewers, "Mr. XXXX (the vocational education instructor) calls me some mornings to make sure I come to school. He does that for several students."

Teachers in exemplary programs accepted student diversity. They created a positive climate in their classes; they were demanding, having high expectations of students, and yet they were

friendly and encouraging. They were very competent in the technical knowledge and skills required in their vocational fields. Also, they conveyed an attitude of professionalism consistent with their occupational area through attention to personal appearance, and expected the same of their students.

Student Attributes

A strong sense of pride among the students was noted at each of the institutions visited. Students had positive feelings about being involved in their programs. They maintained professional standards among themselves, including appropriate behavior and dress.

Many students indicated they believed that entry into their programs was by a selective process. This finding was especially interesting in light of the fact that almost all of the institutions participating in this study were open enrollment schools, which means they could not establish policies which prohibited student enrollment into their programs. Many programs administered written tests, individual career counseling sessions, and departmental interviews prior to admission to a program; this seems to have contributed to the selectivity perception. However, the perception of selection was not highly discouraged and may even have been perpetuated as a part of an underlying student esteem-building activity.

Vocational Student Organizations

Active vocational student organizations exist in the majority of the institutions studied, regardless of the level or age of the students involved. Not everyone was in accord as to the importance of these organizations and activities to the total educational program of each student. However, students and instructors actively involved in vocational student organizations generally discussed their value in such terms as "student recognition," "leadership," "public relations," and "personal development."

Curriculum

At each of the institutions studied, the researchers sought to determine the nature or content of the curriculum as well as its underlying philosophies, and found strong evidence of three important subthemes of curriculum.

1. The technical content of each of the program offerings is strongly influenced by the use of industry/community-based advisory committees, but that content is tempered by the teaching methodology concerns of instructors who work in close cooperation with these committees.
2. Individual faculty members have a strong sense of ownership in their curricula, having major responsibility for the development, implementation and updating of the curriculum for their programs.
3. There is much more being taught to students than technical content. Perhaps of more importance was the finding that programs in these institutions appeared to provide for additional student skills in the affective, personal development, and general problem-solving areas.

Support Services

Each of the institutions visited had well-developed support service programs, including general education programs or "basic skills centers," career counseling, job placement programs for students, and clerical support for instructors.

Institutional Marketing

Nearly all of the institutions did a good job of marketing their programs to the related industries in their geographic service areas. Marketing was done by establishing support for each program through the use of advisory committees, and by providing support and encouragement for faculty members to actively participate in industry-based activities. There was a general expectation of faculty members to physically "get out of the building" and into the businesses.

The report, titled *Assessing the Nature and Operation of Institutional Excellence in Vocational Education*, was completed by George Wardlow of the University of Minnesota, Gordon Swanson of the University of California at Berkeley, and Jerome Migler of the University of Minnesota. ■

(For complete report, order # MDS-174)

NEW YORK CITY'S CAREER MAGNET SCHOOLS BENEFIT "LOTTERY" STUDENTS

Career magnet schools in New York City benefit the students who want to attend them and who would normally be turned away by school admission committees.

At least during the ninth grade, these career magnets:

1. Encouraged students to stay in school;
2. Raised reading scores; and
3. Gave students more credits toward graduation.

The last two results hold only for readers with average reading performance. However, students with below-average reading scores also benefit from the program in that they are more likely to pass the advanced mathematics test required for the New York State regents diploma. The one drawback is a high absenteeism of students with poor reading scores in these programs.

This is a summary statement from *The Effectiveness of New York City's Career Magnet Schools: An Evaluation of Ninth Grade Performance Using an Experimental Design*, a new report of research from the National Center for Research in Vocational Education.

Would it be a good idea if other big cities with school populations like New York—heavily minority with a large immigrant segment—created a collection of career magnet schools with "lottery admission" opportunities for students who would normally be turned away?

The report responds: "The answer to this question is almost certainly yes. The theory is that providing students with education which is relevant to their future careers is effective in motivating them to stay in school, see their schoolwork as important, and become more serious in thinking about and planning for their futures. The lottery winners are presumably more motivated in class by the clear sense of purpose and the hope of future career prospects. Keeping the magnet students together in a small program contributes to a good classroom climate and allows positive peer influences to work."

The career magnet high schools in New York City are career-oriented in the sense that they advertise themselves as preparing students for a particular career, ranging from law to fine arts to secretarial work. However, they are not vocational schools because they also prepare students for college, and attract many students for that reason. According to the report, this is especially true for African American students who have long seen higher education as their best chance for upward mobility.

These career magnet programs are either schools-within-a-school in comprehensive high schools (nearly every high school in New York City has a career magnet program) or else they are located in eight schools dedicated entirely to these programs. In most cases they receive no additional funds from the school board.

When career magnets were first designed, they were intended to be like most magnet schools in America—selective. However, "the New York City Schools have stressed more than any other *de facto* segregated school district in the country the importance of providing equal opportunity to students."

All eighth grade students now are required to apply to high school, using a form which makes it as easy to apply to a magnet school as it is to apply to stay in one's home school. Eighty-two percent of eighth graders state a preference for some sort of magnet school. White collar careers, especially business and computers, are the most popular choices. Nearly one third of all the public high school students in New York City attend one of the 133 magnet programs.

Magnet schools are permitted to select one-half of their students (within specified reading levels) on the

basis of grades and attendance records, which the reports suggests "are probably as good or better than reading scores in predicting high school performance." Other students are assigned randomly, or as the research study indicates, "by lottery." Both the school-selected and the randomly selected group include students with low as well as high reading performance, one-sixth being taken from students with reading scores in the top sixth of all students, one-sixth from the bottom reading group, and the remainder from the large middle group of readers.

Proponents of the career magnet high school argue that these high schools are superior to conventional comprehensive high schools for two main reasons. First, students are more highly motivated because they can see the connection between what they are learning in school and their adult life. The "payoff" in an adult career makes attending school worthwhile and makes sense out of what might be otherwise irrelevant learning. Second, the school's "theme" creates an identity for the school which gives faculty a meaningful purpose in education, motivates them to hold students to higher standards, and helps the school develop an integrated and coherent educational philosophy. This is especially important in urban centers where working class and immigrant adolescents no longer go to work at age 15, but know they are most likely not going on to a four-year college.

This report not only has implications for the New York City schools and other urban school systems, but it has been completed at a time when the nation's educators and political leaders are concerned about the role of choice in the reform of American schools. The advocates of a voucher system hold that its adoption would greatly improve American education.

"Readers may conclude that the educational performance of New York City's career magnets is evidence that they are correct," say the researchers, who then indicate that "this may or may not be true, depending upon how the argument is framed and precisely what school choice proposal is under consideration." They then discuss, at length, "where we think this evaluation does and does not relate to the current school choice debate."

The Effectiveness of New York City's Career Magnet Schools: An Evaluation of Ninth Grade Performance Using an Experimental Design was prepared by Robert L. Crain, Amy L. Heebner, and Yiu-Pong Si, assisted by Will J. Jordan and David R. Kiefer. All are associated with Teachers College, Columbia University. ■

(For complete report, order # MDS-173)

BEYOND ARTICULATION: Tech Prep Programs

What is tech prep, and why did national legislators enact the Tech Prep Education Act of 1990 and allocate over $63 million to promote "the development and operation of articulated 2+2 programs"?

A research report entitled *Beyond Articulation: The Development of Tech Prep Programs*, published by the National Center for Research in Vocational Education, answers these questions and describes in great detail the current state of affairs in tech prep programs.

The answers are based on data collected from nationwide site visits to secondary and postsecondary institutions (in California, Oregon, North Carolina, and Iowa), participation in numerous tech prep conferences, and an extensive review of the literature, including program documents, ERIC files, and academic publications.

There are many successful programs and program variations; program variations tend to reflect differences in planning and implementing processes, and differences among individual schools, students, and local economies. But there are four general components that serve as the foundation for all programs:

1. Information/marketing campaign;
2. Curriculum development;
3. Career guidance; and
4. Program improvement.

Although there is program variation among individual schools, according to the researcher, most administrators would agree their programs reflect agreement with Dale Parnell's definition of the tech prep concept first introduced in *The Neglected Majority* and later defined in greater detail in D. Hull's and Parnell's *Tech Prep Associated Degree: A Win/Win Experience* (1991):

A tech prep/associate degree program is the technical education alternative to college prep. It is targeted for, but not limited to, general education high school students, the forgotten half. A tech prep/associate degree program rests on a foundation of applied academics, courses that incorporate real-life applications and hands-on experience in the teaching of academic subjects. A tech prep/associate degree program is a carefully designed curriculum that engages a high-school student in a four-year (2+2) or six-year (4+2) plan to gain the competencies (knowledge, skills, and values) required for technical careers.

The NCRVE publication walks the reader through each of the components, or steps necessary to articulate and operate a successful tech prep program, offering specific materials from sites visited: for instance, from Hillsboro Union High School District and Portland, Oregon, Community College, a 2+2 *Tech Prep Program Student Guide*; from Cerritos College in Norwalk, California, a manual for counselors and teachers. There are numerous articulation agreements: Aberdeen High School and Grays Harbor College in Aberdeen, Washington, for Business Education/Secretarial Science; from Eastern Iowa Community College District and Davenport Community School District for an Accounting program.

One section of the report presents an examination of the broad social framework that vocational education operates in. Included in this section is a discussion of the economic, technological, and social forces that provided the impetus for many education reforms in the 1980s, including the tech prep programs.

The articulation processes and organizational structures for a tech prep program are clearly described, and there is a section on how states govern and administer vocational education and how federal policies are filtered through state structures.

The data for *Beyond Articulation: The Development of Tech Prep Programs* was gathered and the publication prepared by Carolyn Dornsife of the University of California at Berkeley. ■

(For complete report, order # MDS-311)

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NCRVE Change Agent

Practical Research Center for Leaders

Volume 2, Number 3, Fall/Winter 1992 National Center for Research in Vocational Education

ABOUT NCRVE

The Center is established under authorization of the Carl D. Perkins Vocational Education Act to conduct applied research and development in vocational education. Our mission is to engage in research and service activities designed to make a new vision of work-related education a reality. The Center seeks to increase the access of all Americans, regardless of their aptitudes or abilities, to a high quality work life that is not only economically rewarding, but also personally fulfilling. We seek to enable vocational education to shape (rather than react to) debates over the role of all education. The Center is located at the University of California at Berkeley. Through a network of subcontractors at Columbia University, RAND, the University of Illinois, the University of Minnesota and Virginia Polytechnic Institute and State University, and its host site, the Graduate School of Education at Berkeley, NCRVE is committed to providing the following services in addition to its research agenda: dissemination, technical assistance for planning and evaluation, JTPA and vocational education coordination, leadership development, inservice education, technical assistance to special populations, and materials distribution. This publication is part of our commitment to those on the front lines of vocational education, struggling to create a new vision.

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A HOW-TO GUIDE FOR PERKINS ACT ACCOUNTABILITY

The Perkins Act of 1990 requires states to develop and implement a statewide system of core measures and standards of performance for secondary and postsecondary vocational education programs.

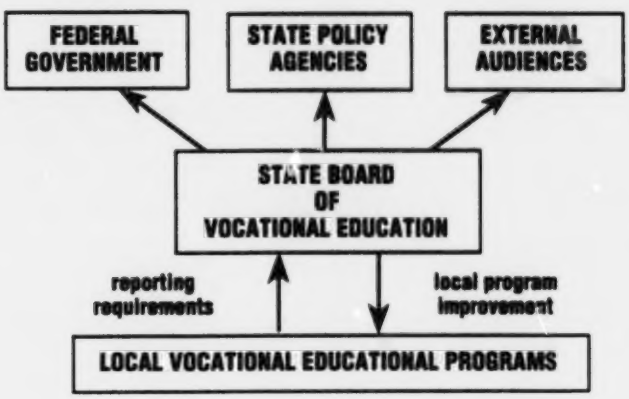
The Perkins Act requires accountability systems to include at least two sets of performance measures. One set must be measures of learning and competency gains, including student progress in the achievement of basic and more advanced academic skills. The other set must include any one of the following four measures:

1. competency attainment,
2. job or work skill attainment,
3. retention in school, or
4. placement in further education, the military, or employment.

Accountability systems must also include appropriate adjustments and incentives for encouraging services to students with special needs. And finally, states and local eligible recipients may supplement these minimal requirements with additional measures, and local recipients may also modify measures and standards to reflect local demographic or economic conditions.

Most states want to go well beyond the minimum requirements of Perkins. In a recent NCRVE survey of the states, only two states indicated that they would limit their systems to the two types of measures required by Perkins; 30 states said they would be developing four or more measures; 15 planned to use seven or more measures. They recognize that limiting accountability to just two measures and standards would unwisely displace a number of other important goals of vocational education. In electing just one of the optional goals, states would send an implicit message that the other outcomes no longer mattered or that their importance had considerably diminished. Consequently, many states are planning to incorporate all five of the measures outlined by Perkins—and in some cases,

Use of Vocational Educational Performance Data



even more measures—in their accountability systems. Developing a sound, comprehensive system of accountability, therefore, poses a major challenge.

The National Center for Research in Vocational Education has developed a guide for administrators developing accountability systems. This 130-page guide, formatted as a loose-leaf notebook with tabs indicating chapters, numerous charts, and titled subsections, should simplify the task for practitioners. The book offers guidelines, suggestions, specific examples, and recommendations for meeting the challenge, and the ideas presented should save states and local recipients some time.

The guide's authors declare that "this is a guidebook, not a litany. There is no one right approach to designing systems of accountability. There are many choices that involve difficult tradeoffs—between accuracy and timeliness, precision and consistency, simplicity and fairness, breadth and burden, knowledge and cost. States and localities will elect to make these choices in different ways and for different reasons. As long as they make these choices with one overriding objective in mind—program improvement—they are not likely to go wrong."

The guidebook is organized into seven chapters. Chapter 1, "Conceptual Framework," builds a conceptual framework for developing systems of accountability that identifies some of the major policy issues that must be addressed. Chapter 2, "Getting Started," identifies some of the basic decisions that must be made at the outset. Chapter 3, "Performance Measures," examines specific examples of performance measures and assesses the pros and cons of different types of measures. It also discusses appropriate distinctions between secondary and postsecondary vocational education.

There is no one right approach to designing systems of accountability.

Chapter 4, "Performance Standards," discusses specific performance standards, providing examples of different standards and procedures for determining them. Chapter 5, "Incentives and Adjustments for Special Populations," describes different approaches for introducing incentives and adjustments for special populations. Chapter 6, "Implementation Issues," considers issues of implementation and includes possibilities for phasing in accountability systems and monitoring and modifying them over time. Chapter 7, "Student Assessment," is the final chapter and provides information on student assessment.

Accountability for Vocational Education: A Practitioner's Guide was prepared by E. Gareth Hoachlander, Karen Levesque, and Mikala L. Rahn of the University of California at Berkeley. ■

(For complete report, order # MDS-407)

COMPUTER-BASED INSTRUCTION AND ISSUES FOR VOCATIONAL EDUCATORS

Four classes of computer-based instruction are emerging from research settings and beginning to appear in classrooms: intelligent tutoring systems (ITS), microworlds, hypermedia environments, and collaborative learning.

Information about these emerging technologies and their applications in vocational education is found in a just-released National Center for Research in Vocational Education report titled *Emerging Uses of Computers for Education: An Overview of Tools and Issues for Vocational Educators.*

Each class of computer-based instruction is appropriate for different goals, subject areas, and learners, and promises to support the higher-order thinking skills demanded by the changing workplace—a workplace changing so rapidly that the American Society for Training and Development predicts that by the year 2000, 75 percent of workers currently employed will need retraining.

- ITS's unique educational feature is the inclusion of artificial intelligence that simulates some of the decisions and actions of human teachers to tune instruction to individual learners and individual problems in complex ways. ITS are most appropriate for supporting the acquisition of well-specified skills by providing strong guidance (when appropriate) and making few demands on the learner for learning initiative: the system itself can take the initiative to prompt or question the learners. Time savings are a primary benefit.

- Microworlds' unique educational feature is the ability to interactively manipulate some environment, with control over some of the variables in that environment. Such systems strongly support exploratory learning of well-understood situations while supplying limited, implicit guidance. Microworlds make moderate demands on the student, and the primary benefits are a deep understanding of the underlying relationships in the microworld and practice with discovery skills. With the shift in desired employee skills towards more critical thinking and higher-order thinking skills, wide development and application of microworlds is expected.

- Hypermedia environments' unique feature is that they supply learners with a rich, tailorable, and extendible knowledge base for learning. The multiple structures or linkages of facts and data support the exploration, construction, understanding, and communication of complex webs of related concepts. However, hypermedia environments require a good deal of student initiative and provide little guidance. Applications of hypermedia environments are growing rapidly and widely.

- Collaborative learning environments' unique educational feature is the explicit, designed-in social support: they strongly support cooperative learning, communication and group problem solving. Any guidance is provided by human instructors, mentors or other learners, rather than by the system itself. These systems can support the learning of any domain with moderate demands on the learner. Collaborative learning environments also have the potential to benefit geographically isolated vocational student populations. By providing the possibility for educational interactions that bridge distance and time barriers, such environments potentially provide inexpensive "teleapprenticeships" for inner-city or rural students with limited opportunities for actual apprenticeships in fields of their choice.

The emerging tools show promise for educational effectiveness; however, developing mastery of any computer can take five to six years.

Although there are many uses for computers in vocational education, vocational educators currently make only very limited use of new tools.

Although there are many uses for computers in vocational education, vocational educators currently make only very limited use of new tools. Military and corporate research and development appear to be leading innovation in the use of these tools. A focus group of vocational educators was given an introductory description, discussion, and videotaped examples of the four types of systems, and were able to envision a variety of potential educational uses for these tools. But there are foreseeable barriers to their

Changes Taking Place in Workplace	Knowledge, Skills, and Disposition Required to Adapt to Change	Emerging Classes of Education Technologies to Support Skill Acquisition
Wider participation in management	Critical thinking	Microworlds, hypermedia, collaborative learning
	Cooperative problem solving	Collaborative learning, microworlds
	Decision making	Microworlds, collaborative learning
	Problem formulation and solutions	Microworlds, hypermedia
	Basic economics	ITS, microworlds
	Communication	Collaborative learning
Work is becoming more distributed	Self-management	Microworlds
	Self-reliance	Microworlds
	Resourceful information seeking	Hypermedia
	Problem formulation and solutions	Microworlds
	Communication	Collaborative learning
Up-skilling for flexible specialization in manufacturing	Creative problem solving	Hypermedia, collaborative learning
	Communication	Collaborative learning
	Technology-specific skills	ITS
Participation in quality control	Statistical reasoning	ITS, microworlds
	Scientific reasoning	Microworlds, ITS
	Communication	Collaborative learning
Technology rapidly changes tasks	Fast acquisition of new knowledge	ITS
	Adaptability: Learn-to-learn	Hypermedia
Technology makes the workings of devices less observable	Abstract reasoning	ITS, microworlds
	Scientific reasoning	ITS, microworlds
Expensive to get actual tools or experience for training	Use of simulators	Microworlds, ITS
On-the-job training in using new tools	Skills specific to optional learning from technologies	ITS, microworlds, hypermedia, collaborative learning

use. The research report addresses these with four recommendations to vocational educators:

1. Prepare now to exploit new technologies as they emerge through teacher and general education. The vocational education community needs to make a strong commitment to build further the foundations for expertise in using computer-based tools in the classroom—mastering the technology itself, and mastering the integration of the technology in the classroom.
2. Address the "infrastructure" issues surrounding implementing and supporting computers in the classrooms. One way to directly address these issues is through funding research into successful models of implementation that are appropriate to vocational settings.
3. Encourage funding of research and demonstration projects concerning applications in vocational education domains.
4. Encourage members of the vocational educational community to play a personal role in software development via points of direct participation.

Vocational educators need to consider that the question is not "if" these tools emerging from research laboratories will affect work-related education; their influence already has begun and continues. The vocational education community must take action to position itself most effectively to use the tools as they mature and to help shape those tools to make them feasible for vocational classrooms.

Emerging Uses of Computers for Education: An Overview of Tools and Issues for Vocational Educators was prepared by Matthew W. Lewis of RAND, Santa Monica, CA. ■

(For complete report, order # MDS-151)

COMMUNITY COLLEGES AND TECHNICAL INSTITUTES: Integration of Occupational and Academic Education

Recent federal legislation requires the integration of vocational and academic education and the business community is pressing for certain competencies it thinks necessary for a more productive workforce. But to date there has been little guidance about such integration, especially at community colleges and technical institutes.

A recent National Center for Research in Vocational Education report describes eight approaches to integrating occupation and academic education found at the postsecondary level. *A Time to Every Purpose: Integrating Occupational and Academic Education in Community Colleges and Technical Institutes* also concludes that integration will benefit students and institutions both directly and indirectly.

The variety of approaches are as follows:

Model 1: General education requirements
The most frequent form of integration is the requirement of general education courses for certain occupational students; typically, however, in community colleges these courses are not modified in any way to suit the interest of occupational students, requiring students themselves to integrate material and perspectives from their academic courses. General education requirements usually apply to students in Associate programs, but not to students in certificate programs or those enrolling for only a few occupational courses. In a few cases, particularly in technical institutes, a clear goal of general education requirements is to provide some context for occupational programs, or a deeper understanding of the forces affecting occupations.

Model 2: Applied academic courses
Another common approach to integration is the development of academic courses with applications in occupational areas, like Technical Writing or Writing for the Workplace, Applied Math or Technical Math (at San Bernadino Community College, California, Technical Math for Nurses is taught), or Agricultural Economics. Often developed as a way of serving the needs of occupational students more precisely, applied academic courses are generally taught to occupational students only and reinforce the segregation of occupational students from others.

Model 3: Cross-curricular efforts: Incorporating academic skills in occupational programs
The best-known cross-curricular effort is Writing Across the Curriculum (WAC), in which all instructors (including occupational faculty) are encouraged to incorporate more writing into their courses. Other similar efforts also have been developed: Communication Across the Curriculum at Prince George's Community College in Maryland; Humanities Across the Technologies at Nashville, Tennessee, State Technical Institute; Reading Across the Curriculum in Metropolitan Community College, Kansas City, Missouri.

Model 4: Incorporating academic modules in expanded occupational courses
Some occupational instructors have introduced modules based on academic disciplines—history or ethics, for example —into their occupational courses to broaden the perspectives of students. The Introduction to Law Enforcement course at Southern Maine Vocational-Technical College recently added a component on the history of law enforcement. Basically Models 3 and 4 are ways of taking existing occupational courses and "stuffing more academic content into them." In contrast, the applied academic courses described in Model 2 are essentially efforts to take standard academic subjects and modify them to include more occupationally relevant examples and applications.

Model 5: Multidisciplinary courses combining academic perspectives and occupational concerns
A number of institutions have developed multidisciplinary courses, often with external funding (primarily National Endowment for the Humanities)

that take the perspectives and methods of academic disciplines and incorporate broad occupationally-oriented issues. Some use literature, both fiction and nonfiction, to explore themes about the role of work for individuals and society; an example is "Working in America" at Kirkwood Community College, Cedar Rapids, Iowa. Several courses examine the history of technology; others, ethical issues surrounding work and technical change. However, NEH funding has ended, and college support for such courses has faded. The researchers see this model as a "promising vision for integrating occupational and academic education," and lament the difficulty institutions have had in institutionalizing such courses.

Model 6: Tandem and cluster courses and learning communities

Another approach has been to develop two or three (or more) complementary courses that students take simultaneously. This practice allows instructors to reinforce material from at least one other course, to present similar issues from different perspectives, to develop common examples and applications, to develop projects undertaken simultaneously in more than one course, and to rely on another course to teach necessary prerequisites. For example, Chemetketa Community College in Salem, Oregon, has developed a Human Services Practicum coupled with Writing 121. Researchers found that in this model students have stronger personal relationships with other students, facilitating collaborative teaching and learning.

Model 7: Colleges-within-colleges

Colleges-within-colleges are, in many ways, expanded clusters, in which students take all their courses together; however, this requirement often is impossible, especially for older students with employment and family obligations. These models are quite rare. Within the institutions interviewed by the researchers, one college-within-a-college failed because of the inflexibility of scheduling required, while another is still in the planning stages.

Model 8: Remediation and English as a Second Language (ESL) programs with an occupational focus

Several colleges have developed remedial or English as a Second Language (ESL) courses to teach basic math and English simultaneously with introductory material in an occupational area. For example, at Bunker Hill Community College in Massachusetts, an ESL program for Allied Health and one for Electronics have been developed. In theory, such approaches can provide greater motivation to students with occupational goals and may be more effective teaching strategies because they provide a context for instruction. Several such programs have documented higher grades and lower dropout rates.

A final section of the report, titled "Why Take This Path," discusses whether integrating vocational and academic education is worth the time and effort necessary. The researchers conclude that "there are several *a priori* reasons for thinking that integration will benefit postsecondary students." A number of approaches described in the report are ways of developing more student-centered curricula which are better suited to the needs and interests of occupational students and have advantages in motivating students. Most will increase the general and academic competencies of students, preparing them for occupations in a world of changing requirements. Some integration efforts also include material related to occupational alternatives, providing a vehicle for career exploration, and others include opportunities to explore the political and moral issues that are widely cited as important components of education but often ignored.

There also are some indirect benefits. Integration efforts provide natural ways for faculty to collaborate and particularly, to break down the isolation between occupational and academic instructors. (See "Two Worlds: Vocational and Academic Teachers" in this issue.) Some approaches—particularly tandem and cluster courses and learning communities—provide structures that facilitate more coherent programs, helping students avoid the "milling around" that is common in community colleges. Finally, "integration can help bridge the distinct islands of activity within the community college, providing a way of moving toward a true community of learners."

A Time to Every Purpose: Integrating Occupational and Academic Education in Community Colleges and Technical Institutes is the work of W. Norton Grubb and Eileen Kraskouskas of the University of California at Berkeley. ■

(For complete report, order # MDS-251)

CAREER MAGNET HIGH SCHOOLS: Successes and Problems

Career magnets foster an optimistic future orientation among students, according to a National Center for Research in Vocational Education study which interviewed 70 students and 62 school staff in four New York City high schools. The findings from the interviews study have just been published in *Career Magnets: Interviews with Students and Staff*.

Two sites where interviews were conducted were "total magnet" programs; that is, all enrolled students were involved in some phase of the career education program. One was a business magnet, the other a communications magnet. The other sites each had a career magnet program within a traditional comprehensive high school; one a cosmetology program, the other a criminal justice program. In the comprehensive high schools, career as well as non-career students and faculty were interviewed.

In contrast to the comprehensive schools, where many students are vague about their futures and unable to present a clear plan for their lives, the students in the career magnets are both more articulate and optimistic. Researchers found a range of planning strategies, from the sophisticated (a highly specific career-track plan with one or more contingency plans) to the rudimentary (a plan to take an entry-level job after high school). Career magnets seem to influence student attitudes, not only through vocationally oriented classes, but also through informal interactions with students and staff.

Other findings from the interviews follow:

- Students at the career magnets develop multiple strategies for mixing future work and education. The students' confidence that there is a possible entry-level position that they could enter after high school increases their sense of economic security enough to allow them to think more clearly about the benefits of going to college.
- Students at the career magnets learn about values and social skills associated with work and benefit from their new school peer groups. These students, even those from disadvantaged backgrounds, display respect for cooperation, commitment, and other work-related values.
- Students in the career magnets have a more positive attitude toward their school, their faculty and what they feel they are learning. In nearly every case, this is because they are pleased with the career training they are receiving.

Students in the career magnets are both more articulate and optimistic.

Interviews with faculty also suggest reasons why these schools may be effective:

- Faculty morale is higher at career magnets than at the studied comprehensive high schools. This may be because magnet faculty members are aware that they have better students: half the students are school-selected, and the other half were attending the school by choice. Or the positive attitude toward their students may grow out of the schools' "focus" which creates a sense of community and common goals.
- The success of Communications High School may also be because it is small.

The interviews with students and faculty also revealed some serious problems in the career magnets. Most low income and minority students lack "job knowledge"—that is, the information and skills needed to start and to build a productive career. While the career magnets make a serious effort to train students, they may have overestimated the amount that students know or could learn on their

own about the adult world of work and the particular careers they were interested in. In many cases, the students who are most comfortable with their career choices are beneficiaries of having a family member with some work experience in the same area, and these are usually from middle-class families.

The career magnets seem to hold promise as a way out of the employment patterns of disadvantaged families, but even these schools do not go far enough to help some of the disadvantaged students among those interviewed.

Another serious problem, one shared by the comprehensive high schools and the magnet schools, is a serious deficiency in the amount of career guidance available, especially for the at-risk students. The strategy of one magnet high school, to involve all faculty members in the counseling process, "seemed to be highly successful, and we believe that other schools should consider this approach."

Total career magnets do not do as good a job of educating students with poor academic records as they do with students of average performance. Remedial services are inadequate for meeting the needs of unprepared students, especially those admitted by random assignment. Generally, according to the researchers, this is a matter of limited resources.

Career Magnets: Interviews with Students and Staff was prepared by Robert L. Crain, Amy Heebner, David R. Kiefer, and Yiu-Pong Si, with assistance from Will J. Jordan and Barbara Tokarska, all of Teachers College, Columbia University. ■

(For the complete report, order # MDS-386)

VOCATIONAL EDUCATION FOR PREGNANT AND PARENTING STUDENTS: Practical Problems and Fundamental Dilemmas

Both teenage pregnancy and vocational education have long been of concern to policymakers, youth advocates, and the general public. In many respects, however these concerns have been independent ones.

"Early vocational education efforts focused largely on males, who were widely viewed as the key to reducing poverty, unemployment and welfare dependance. As growing numbers of women have entered the workforce in recent years, it has become apparent that women would benefit as well from training and job assistance. Nevertheless, our society continues to be ambivalent about whether employment by mothers of very young children is appropriate or ultimately beneficial to children, mothers, or society. This ambivalence has been evidenced in programs for teenage mothers, which, until recently, have rarely offered or brokered vocational education or employment-related services to enrollees."

This is the background summary with which a National Center for Research in Vocational Education report opens. The report, *Access to and Use of Vocational Education in Teen Parent Programs,* explores vocational educational opportunities for pregnant and parenting students in middle school and high school.

The 1984 Perkins Act codified concerns about equal access to vocational education for women, and the Family Support Act of 1988 requires each state to develop a Job Opportunities and Basic Skills (JOBS) program designed to cut the costs of social welfare programs by making recipients work.

The researchers considered both school-sponsored and community-sponsored programs, and their findings regarding both access to and use of vocational education are generally negative.

"The provision of vocational education in the context of programs for pregnant and parenting students poses many practical problems as well as some fundamental dilemmas," the report concludes.

Program enrollees may not take advantage of vocational education opportunities for a number of reasons, including lack of time, lack of child care flexibility, reluctance to leave the parenting program site and take a bus to a vocational education site, and lack of a clear sense of the importance of work-related education. Additionally, vocational education requirements and strict attendance policies make school involvement difficult for teen mothers, whose schedules must accommodate clinic appointments and well-baby visits.

And, despite strong beliefs among program staff that teen mothers must become economically self-sufficient, they may not push vocational education for reasons of their own, including concerns about interfering in personal decisions and conveying negative messages, beliefs in the primacy of parenting education, and sympathy for the many demands young mothers face. Limited attention in most teen parent programs to these issues and the dilemmas that underlie them reduce the use and utility of vocational education.

The report concludes that "Teen parent programs have taken on a great deal—a reflection of the many pressing needs that teen mothers bring to them. *Whether or not these programs can, or even should, attempt to provide vocational education, and if so, what kinds, remains an open question* [emphasis ours]." Much depends on program goals; school district, community and program resources; and the service model to which the program ascribes.

Our society continues to be ambivalent about whether employment by mothers of very young children is appropriate or ultimately beneficial to children, mothers, or society.

But regardless of what vocational education is provided by the program, stronger emphasis on the need for job-skills training at some point, combined with concrete, personalized career planning, would greatly benefit program enrollees and send them an important, if more complex, message about the joys and responsibilities of parenting.

Access to and Use of Vocational Education in Teen Parent Programs was prepared by Gail L. Zellman, Christine Feifer and Amy E. Hirsch at RAND, Santa Monica, CA. ■

(For complete report, order # MDS-152)

VOCATIONAL EDUCATION AT PENAL INSTITUTIONS: A Discouraging History

"It remains to be seen whether vocationally oriented correctional education can find a secure niche for itself in the 1990s within the growing political movement led by state governments to revive prison industries in order to defray the massive costs of prison expansion. . . . The political alignments that in the past have regularly defeated prison industries appear again to be forming."

This is one conclusion in a NCRVE report titled *Bright Hopes, Dim Realities: Vocational Innovation in American Correctional Education*. The report identifies some

general tendencies in the history of correctional education in the 19th and 20th centuries; presents a more systematic history of correctional education between approximately 1890 and 1960; focuses on the contributions of the famous prison superintendent Zebulon Brockway to correctional education; and provides a case study of the New York State Vocational Institution, examining "the enormous difficulties that have bedeviled even the best-designed and well-intentioned efforts to transform prisons into institutions of vocational education."

As part of its conclusion, the report gloomily predicts that "it would be historically unprecedented for correctional education to gain a wide hearing under the aegis of a penal philosophy committed quite openly to the goals of deterrence and retribution rather than to rehabilitation as the primary goal of imprisonment."

Under these circumstances, is there anything that leaders in the field of correctional education can now usefully do to increase the prospects for future change?

"The prudent strategy," the report's authors suggest," may not be to attempt to innovate widely, but rather to encourage small-scale, carefully designed and evaluated experimental studies. Then, when a more propitious public sentiment emerges (as has occurred periodically in the past), the leaders in the field will confidently be able to address policymakers from a training standpoint about 'what works.'

"Too often, we believe, proponents of correctional education programs—especially those with a vocational focus—have proclaimed the virtues of their ideas as self-evident: as if the greater alleged 'practicality' of vocational programs guaranteed them both wider public support and greater rehabilitative effectiveness than other interventions. This is no longer adequate," the researchers state.

"The corrections field itself, and also legislators, have traveled down the reform road of vocational education too often to be persuaded by superficial invocations of the work ethos as a remedy for recidivism. This is not to argue against innovative educational programming in correctional institutions, but rather to insist that the development of a persuasive, empirically grounded justification for investment in vocational education ought to be considered necessary before it is decided, as a matter of policy, to choose this educational route rather than some other. Unless it can be shown that vocational programming is superior to other educational or therapeutic interventions with prisoners, there seems no compelling reason to assure it to be so."

"Unless it can be shown that vocational programming is superior to other educational or therapeutic interventions with prisoners, there seems no compelling reason to assure it to be so."

From their historical research, and particularly their case study of the New York State Vocational Institution in New York's penal system, the authors of the report conclude that "prison-based vocational programs seem perennially vulnerable to dissolution."

They list seven major problems:

1. Correctional education programs are very difficult to develop from a pedagogical standpoint—a difficulty that many vocal advocates seem loathe to acknowledge, take seriously, or invest resources in.

2. It is difficult to locate and keep talented, appropriate staff to teach and supervise vocational courses in prison; poor pay is only one of the disincentives.

3. It is expensive at the onset for prisons to afford up-to-date equipment for vocational training,

and, after the initial investment, to keep the equipment current with rapidly changing technologies.

4. It is often not possible to attract sufficiently talented inmates to participate in the programs, or to retain them long enough to acquire sophisticated work skills.

5. Gaining, or at least sustaining, the allegiance of correctional administrators to vocational programs is problematic, because vocational courses do little to enhance the control objectives of prisons compared with other labor regimens.

6. Vocational programs have always been susceptible to multiple political challenges (i.e., they make enemies easily) from labor unions to business executives to legislators.

7. It is often excruciatingly difficult to find employment for "graduates" following release.

These abiding problems are no more easily resolvable today than they were a half a century ago, say the researchers, citing the 1930s as "a heyday of belief by American society in the expertise of professional educators," and a unique period in that the educational critics of traditional penology were given a direct opportunity to put their ideas into practice.

Bright Hopes, Dim Realities: Vocational Innovation in American Correctional Education was prepared by Steven Schlossman and Joseph Spillane for the NCRVE site at RAND. ■

(For complete report, order # MDS-077)

LINKING PLANNING AND EVALUATION STATEWIDE

Substantive planning and comprehensive evaluation in vocational education are not clearly linked in most states. But this need not be the case.

Strategies for Linking Planning and Evaluation in Vocational and Technical Education, an NCRVE report based on a review of literature, surveys of states and examples from three case studies, suggests strategies that will facilitate linkages between planning and evaluation as well as articulation across secondary and postsecondary levels.

The research found that the following factors could lead to the linking of planning and evaluation:

- Initiatives at the state level to drive educational changes, such as mandates for program improvement, education for employment, and planning for the future.
- A clear policy focus or mission formulated by the state.
- Strong leadership at the state, regional and local levels.
- Administrative commitment at all levels.
- Interagency cooperation at all levels.
- Regional coordination among government agencies, community and privately-based vocational education and training providers, and the public educational institution. Regional coordination can discourage traditional "turf battles" and can encourage the involvement of business and industry and the inclusion of community needs in the planning and evaluation process.
- In-depth data collection systems and extensive evaluation procedures for analyzing the data collected.
- An emphasis on comprehensive vocational education.

Disincentives to linking planning and evaluation include tradition and maintaining the status quo; difficulty in taking risks in administrative planning; problems in understanding all of the benefits of articulation and linking; demographic differences across a state's geography; the time needed to build trust among agencies, businesses, and individuals; and the lack of consistent evaluation procedures, philosophies, and contexts for secondary and postsecondary educational systems.

Improved funding utilization was found to be among the positive impacts of effective linking and articulation.

Strategies for Linking Planning and Evaluation in Vocational and Technical Education was prepared by Donald E. Elson, J. Dale Oliver, and Deborah C. Strickland, all of Virginia Polytechnic Institute and State University. ■

(For complete report, order # MDS-235)

TWO WORLDS: Vocational and Academic Teachers

"Academic and vocational teachers occupy two separate worlds in comprehensive high schools. Not all teachers and not in all schools, to be sure; but the 'two worlds' phenomenon is sufficiently pervasive, and sufficiently embedded in habitual ways of thought and deed, to command attention. Research on secondary schools underscores the relative primacy of the academic domain."

This is the way a report recently released by the National Center for Research in Vocational Education begins. Titled *Two Worlds: Vocational and Academic Teachers in Comprehensive High Schools*, it is one of two which call attention to the fact that "vocational teachers have remained nearly invisible in the mainstream literature on high schools," despite the considerable attention devoted to the problems and prospects of a vocational curriculum and the "lofty aims" of reformers who seek a more productive integration of the academic and vocational missions of high school.

The second paper is titled *Work on the Margins: The Experience of Vocational Teachers in Comprehensive High Schools*. It chronicles the personal consequences of the decline of vocational programs.

Two Worlds "attends to the place that vocational teachers occupy in the professional community of the high school"; its analysis of teachers' worlds is shaped most broadly by a concern for the vitality of secondary schooling. The paper is based on a study of five comprehensive high schools: three urban, one suburban, and one described as urban on the "suburban edge."

Table 1 from the report, reproduced in this issue of *Change Agent*, summarizes the characteristics of the five schools and the "Main Story" of vocational education at those schools.

The report concludes that "three aspects of the professional community underscore and sustain the two worlds of nonacademic and academic teachers," and that "each is a potential guarantor of the status quo or a potential lever of change."

First is a generalized pattern of patchwork involvement among colleagues and the collegial dynamics fostered by competition over student enrollment and other resources.

Second is the legacy of subject specialization and the conditions surrounding subject expertise and status.

Third and perhaps most significant is the departmental organization of the high school and the boundaries it constructs in the conceptualization of purpose, curriculum, pedagogy, and colleagueship.

"Ironically, the very resources that give some departments their strength may operate as obstacles to efforts to create more permeable boundaries among subject disciplines. That is, a department with a full-time cadre of subject specialists and well-established curricular policies might also be so committed to subject integrity that it would act as a barrier to integration....Among the external forces, for example, university admission requirements exercise...a 'chilling effect' on innovation in the secondary curriculum. Teachers might be induced to modify their subject orientations and commitments if the university were to require evidence that students had participated in cross-disciplinary course work, or had engaged in projects that required integrating their knowledge from multiple disciplines," the report concludes.

Judith Warren Little of the University of California in Berkeley prepared *Two Worlds*, and, with Susan M.

Summary Characteristics of the Five Schools (1989-1990)

SCHOOL CHARACTERISTICS	OAK VALLEY	ONYX RIDGE	VALLEY	ESPERANZA	RANCHO
Size S<885, M 885-1500, L 1501-2075, L+>2075	Large+	Medium	Medium	Medium	Large
Minority % L < 10%, M 10-29%, H 30-55%, H+ >55%	Medium	High	High +	High +	High
Student Achievement (1=highest; 5=lowest)	2.3	2.3	3.7	3.2	3.3
Location of school	Suburban district	Urban district "suburban edge"	Urban	Urban	Urban
Grade structure	9-12	10-12	9-12	9-12	9-12
Teachers in industrial arts, home ec, business	17 (12.5% of staff)	5 (9% of staff)	7 (14% of staff)	9 (15% of staff)	8 (11.2% of staff)
The main "story" of vocational education	1. Suburban affluent school dominated by "college prep" 2. Decline in vocational staff and course offerings 3. Vocational teachers assigned to low-level academic courses 4. Increase in personal interest electives	1. "College prep" mission in a school with sizable based-in minority population 2. Decline in vocational staff and course offerings 3. Vocational education converted to personal interest electives	1. Academic teachers discouraged by shift in school population 2. Relatively stable vocational program with traditional offerings 3. State-funded occupational programs tailored for special ed. students	1. School developing as science magnet 2. Decline in vocational staff and course offerings 3. Vocational education used to absorb ESL and special ed. students 4. Pressure to "market" personal interest electives	1. Non-traditional school org. into "learning units" 2. Decline in vocational staff and course offerings 3. Vocational education used to absorb ESL and special ed. students 4. Pressure to "market" personal interest electives

Threatt, also of UCB, authored *Work on the Margins*, arising from the same study of five comprehensive high schools and the "peripheral nature" of vocational education in those schools.

Little and Threatt conclude that "the purposes and priorities of these comprehensive high schools tend to be ordered in ways that concentrate symbolic acclaim and material resources on academic courses or teachers." (A graphic arts teacher who is trying to add more computers to his program complains, "The biggest thing I really get tired of is scrounging. Why is it left to me to try and present a better program to my kids? It's left up to my ability to go out and scrounge and bring up my equipment. . . . I don't think that's right.")

An institutional orientation toward the college bound permeates these schools, diminishing the contributions of vocational and other non-academic teachers, and reinforcing long-standing dichotomies between theory and practice, and between intellectual and practical endeavors. Vocational classes are used to absorb increasing numbers of students who have been designated as "limited-English-speaking," "special education," "remedial," or "at risk."

The value placed on college-bound students creates the standard of worth both for students and teachers. Vocational courses and the students they enroll are not work-oriented in any favorable sense, but are emphatically "non-college bound". The emphasis on college attendance diminishes the prestige felt by teachers who preferred not only to prepare students for work after high school, but to supply all students with a range of technical competence and practical reasoning capacity that extends beyond what is usually offered in academic classes. This emphasis also diminishes the capacity of vocational teachers, individually and as a group, to exert influence in the larger institution.

(For "Two Worlds: Vocational and Academic Teachers in Comprehensive High Schools," order # MDS-438. For "Work on the Margins: The Experience of Vocational Teachers in Comprehensive High Schools" order # MDS-166.)

A FRAMEWORK FOR THE SUBJECT MATTER OF VOCATIONAL EDUCATION

Vocational education as a professional field is in need of a more intellectually convincing framework for its subject matter.

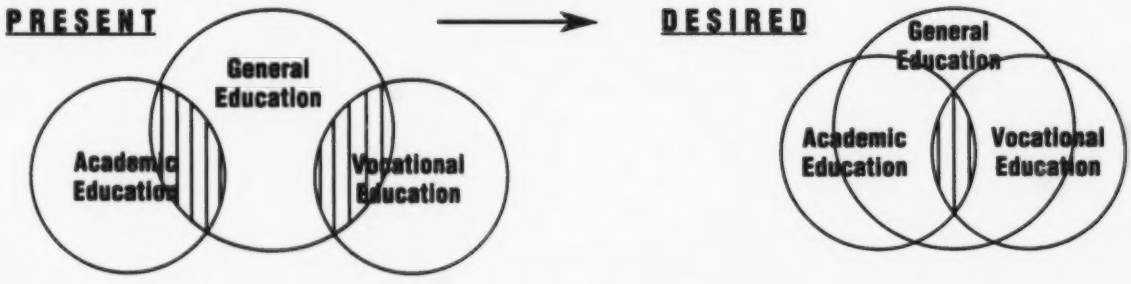
"Since the introduction of vocational education as a curricular category in the nation's public schools at the beginning of the twentieth century, it has taken its basic direction and substance from federal legislation. Although the continuous support of federal legislation is applauded as an indication of strong and committed public interest, the legislative arena does not provide a sustained and disciplined context for organizing the subject matter of a maturing professional field."

This is from the introduction of a new National Center for Research in Vocational Education report; the purpose of the report is to initiate an intellectual conversation about the subject matter of vocational education. The goal "is to develop a conceptual framework that will guide the decisions for the aims, curriculum, instruction, and assessment of vocational education." The report is titled *A Framework for the Subject Matter of Vocational Education.*

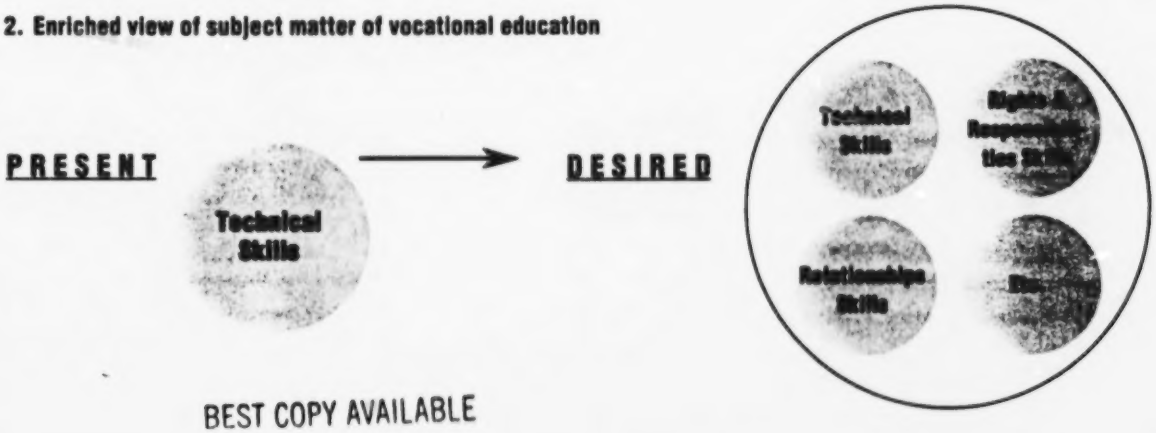
According to the report, the question of the subject matter of vocational education should be viewed as "a practical one." Practical here refers to questions required for their resolution and attention to aims,

Proposed Transformations in the Subject Matter of Education, More Practically Vocational Education

1. Enriched view of general education for all students



2. Enriched view of subject matter of vocational education



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content, alternatives, and consequences. The resolution requires judgment and action that will have real effects on the stakeholders in the vocational education enterprise.

A conceptional framework for the subject matter of vocational education "should identify and organize assumptions and propositions to guide vocational education through the array of problems it faces over time," the report states. "The framework should assist professional vocational educators to understand the problems at hand and those anticipated, to draw helpful insights from relevant disciplines, to practice with the guidance of ethical ideals, and to take actions that are intellectually coherent and morally justified.

Practical problems include:

1. the relationship of vocational education to the ideal of an educated person;
2. the relationship of vocational education to other curricular categories (i.e., English, social studies, mathematics, science, arts);
3. the appropriate vocational education for various episodes or phases in the life-long process of vocational development;
4. the appropriate vocational education for a wide diversity of learners;
5. the social status of vocational education and different kinds of vocational responsibilities; and
6. attributes of being modern and up-to-date in the context of current social and economic changes.

The report stresses that "a useful conceptual framework for vocational education must prove itself by assisting professionals to resolve these problems in their everyday manifestations justly and with a sense of making progress toward ultimate goals."

The report devotes ten pages to the thoughts of John Dewey regarding the meaning of vocation and an additional ten pages reviewing the thoughts of others, including Marx, on the subject. It also includes ten pages of references and numerous charts. It was prepared by George H. Copa of the University of Minnesota. ■

(For complete report, order # MDS-095)

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